



Device Material Content

5555 NE Moore Ct.
Hillsboro OR 97124
custreq@latticesemi.com

Assembly: ASEM
Size (mm): 10 x 10

Package Code:

MG328

Package: 328 csBGA
Total Device Weight 0.31 Grams

Lead pitch (mm): 1.0

MSL: 3

Reflow max (°C): 250

August, 2019

Products:

FE3

| | % of Total Pkg. Wt. | Weight (g) | % of Total Pkg. Wt. | Weight (g) | Substance | CAS # | % of Subst. | Notes / Assumptions: |
|----------------------|---------------------|------------|---------------------|------------|-------------------------------------|-------------|-------------|---|
| Die | 4.49% | 0.0139 | 4.49% | 0.0139 | Silicon chip | 7440-21-3 | 100.00% | Die size: 4.60 x 5.20 mm |
| Mold Compound | 50.20% | 0.1556 | 2.51% | 0.0078 | Epoxy Resin A | - | 5.00% | Mold Compound: Sumitomo G750SE (ULA) |
| | | | 0.75% | 0.0023 | Epoxy Resin B | - | 1.50% | |
| | | | 2.51% | 0.0078 | Phenol Novolac | 9003-35-4 | 5.00% | |
| | | | 2.51% | 0.0078 | Metal Hydroxide | - | 5.00% | |
| | | | 0.15% | 0.0005 | Carbon Black | 1333-86-4 | 0.30% | |
| | | | 41.76% | 0.1295 | Silica Fused | 60676-86-0 | 83.20% | |
| D/A Epoxy | 0.69% | 0.0021 | 0.55% | 0.0017 | Silver | 7440-22-4 | 80.00% | Die attach epoxy: Henkel (Ablebond) 2100A |
| | | | 0.14% | 0.0004 | Esters & resins | - | 20.00% | |
| Wire | 0.77% | 0.0024 | 0.76% | 0.0024 | Copper | 7440-50-8 | 98.50% | 0.8 mil diameter; 1 wire per solder ball |
| | | | 0.01% | 0.0000 | Palladium | 7440-05-3 | 1.50% | |
| Solder Balls | 11.11% | 0.0344 | 10.72% | 0.0332 | Tin (Sn) | 7440-31-5 | 96.50% | SAC305 |
| | | | 0.33% | 0.0010 | Silver (Ag) | 7440-22-4 | 3.00% | |
| | | | 0.06% | 0.0002 | Copper (Cu) | 7440-50-8 | 0.50% | |
| Substrate | 15.98% | 0.0495 | 5.11% | 0.0158 | BT Resins | - | 32.00% | BT Resin CCL-HL832NX-A* |
| | | | 10.86% | 0.0337 | Glass fiber | 65997-17-3 | 68.00% | |
| Foil | 11.56% | 0.0358 | 8.02% | 0.0249 | Copper | 7440-50-8 | 69.41% | |
| | | | 2.88% | 0.0089 | Nickel plating | 7440-02-0 | 24.93% | |
| | | | 0.65% | 0.0020 | Gold plating | 7440-57-5 | 5.67% | |
| Solder Mask | 5.21% | 0.0161 | 2.83% | 0.0088 | Quartz | 14808-60-7 | 54.37% | Solder mask PSR4000 AUS 308 |
| | | | 0.38% | 0.0012 | Dipropylene glycol monomethyl ether | 34590-94-8 | 7.33% | |
| | | | 0.17% | 0.0005 | Morpholine derivative | 71868-10-5 | 3.32% | |
| | | | 0.16% | 0.0005 | Silicon dioxide | 7631-86-9 | 3.00% | |
| | | | 0.16% | 0.0005 | Silica, amorphous | 112945-52-5 | 3.00% | |
| | | | 0.01% | 0.0000 | Carbon black | 1333-86-4 | 0.24% | |
| | | | 1.50% | 0.0046 | Trade secret ingredients | - | 28.74% | |
| | | | | | | | | |

Notes: * 0.16% max. concentration (of total pkg wt.) of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.

Lattice regards this materials information to be correct but makes no guarantee as to its accuracy or completeness, including, but not limited to, with respect to its compliance with applicable environmental laws and regulations. Lattice subcontracts the production, test and assembly of hardware devices to independent third-party vendors and materials suppliers ("Contractors"). All data provided hereunder is based on information received from Contractors. Lattice has not independently verified the accuracy or completeness of this information which is provided solely for your reference in connection with the use of Lattice products.

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Rev. P



Device Material Content

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MG328

Assembly: ASET

Size (mm): 10 x 10

Lead pitch (mm): 1.0

MSL: 3

Reflow max (°C): 250

Package: 328 csBGA

Total Device Weight 0.31 Grams

Products:

FE3

August, 2019

| | % of Total Pkg. Wt. | Weight (g) | % of Total Pkg. Wt. | Weight (g) | Substance | CAS # | % of Subst. | Notes / Assumptions: |
|---------------|---------------------|------------|---------------------|------------|-------------------------------------|-------------|-------------|--|
| Die | 4.49% | 0.0139 | 4.49% | 0.0139 | Silicon chip | 7440-21-3 | 100.00% | Die size: 4.60 x 5.20 mm |
| Mold Compound | 50.20% | 0.1556 | 43.92% | 0.1362 | Silica | 60676-86-0 | 87.50% | Mold Compound: Kyocera KE-G2250 series (ULA) |
| | | | 3.26% | 0.0101 | Epoxy resin | - | 6.50% | |
| | | | 2.76% | 0.0086 | Phenol Resin | - | 5.50% | |
| | | | 0.25% | 0.0008 | Carbon Black | 1333-86-4 | 0.50% | |
| D/A Epoxy | 0.69% | 0.0021 | 0.55% | 0.0017 | Silver | 7440-22-4 | 80.00% | Die attach epoxy: Henkel (Ablebond) 2100A |
| | | | 0.14% | 0.0004 | Esters & resins | - | 20.00% | |
| Wire | 0.77% | 0.0024 | 0.76% | 0.00237 | Copper | 7440-50-8 | 98.50% | 0.8 mil diameter; 1 wire per solder ball |
| | | | 0.01% | 0.00004 | Palladium | 7440-05-3 | 1.50% | |
| Solder Balls | 11.11% | 0.0344 | 10.95% | 0.0339 | Tin (Sn) | 7440-31-5 | 98.50% | SAC105 |
| | | | 0.11% | 0.0003 | Silver (Ag) | 7440-22-4 | 1.00% | |
| | | | 0.06% | 0.0002 | Copper (Cu) | 7440-50-8 | 0.50% | |
| Substrate | 15.98% | 0.0495 | 5.11% | 0.01585 | BT Resins | - | 32.00% | BT Resin CCL-HL832NX-A* |
| | | | 10.86% | 0.03368 | Glass fiber | 65997-17-3 | 68.00% | |
| Foil | 11.56% | 0.0358 | 8.02% | 0.02487 | Copper | 7440-50-8 | 69.41% | |
| | | | 2.88% | 0.00893 | Nickel plating | 7440-02-0 | 24.93% | |
| | | | 0.65% | 0.00203 | Gold plating | 7440-57-5 | 5.67% | |
| Solder Mask | 5.21% | 0.0161 | 2.83% | 0.00877 | Quartz | 14808-60-7 | 54.37% | Solder mask PSR4000 AUS 308 |
| | | | 0.38% | 0.00118 | Dipropylene glycol monomethyl ether | 34590-94-8 | 7.33% | |
| | | | 0.17% | 0.00054 | Morpholine derivative | 71868-10-5 | 3.32% | |
| | | | 0.16% | 0.00048 | Silicon dioxide | 7631-86-9 | 3.00% | |
| | | | 0.16% | 0.00048 | Silica, amorphous | 112945-52-5 | 3.00% | |
| | | | 0.01% | 0.00004 | Carbon black | 1333-86-4 | 0.24% | |
| | | | 1.50% | 0.00464 | Trade secret ingredients | - | 28.74% | |
| | | | | | | | | |

Notes: * 0.16% max. concentration (of total pkg wt.) of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.

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