# Device Material Content

LATTICE SEMICONDUCTOR

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

April, 2018

**Package:** 25 WLCSP
**Total Device Weight** 3.162 Milligrams

**Package Code:** SWG25
**Products:** ICE40LM

Assembly: ASET
Size (mm): 1.7 x 1.7
Lead pitch (mm): 0.35
MSL: 1
Reflow max (°C): 260

| | % of Total Pkg. Wt. | Weight (mg) | % of Total Pkg. Wt. | Weight (mg) | Substance | CAS # | % of Subst. | Notes / Assumptions: |
|---|---|---|---|---|---|---|---|---|
| **Die** | 57.32% | 1.813 | 57.32% | 1.8126 | Silicon chip | 7440-21-3 | 100.00% | Die size: 1.7 x 1.7 mm |
| **Repassivation** | 2.15% | 0.068 | 0.75% | 0.0238 | Polyamide | - | 35.00% | PBO HD8820 |
| | | | 1.03% | 0.0326 | Gamma-butyrolactone | 96-48-0 | 48.00% | |
| | | | 0.09% | 0.0027 | Propylene Glycol Monomethyl Ether Acetate | 108-65-6 | 4.00% | |
| | | | 0.28% | 0.0088 | Proprietary ingredients | - | 13.00% | |
| **Redistribution metal 1** | 0.05% | 0.001 | 0.05% | 0.0015 | Titanium (Ti) | 7440-32-6 | 100.00% | |
| **Redistribution metal 2** | 3.85% | 0.122 | 3.85% | 0.1216 | Copper (Cu) | 7440-50-8 | 100.00% | |
| **UBM metalization 1** | 0.05% | 0.001 | 0.0471% | 0.0015 | Titanium (Ti) | 7440-32-6 | 100.00% | |
| **UBM metalization 2** | 7.97% | 0.252 | 7.9680% | 0.2519 | Copper (Cu) | 7440-50-8 | 100.00% | |
| **Solder Balls** | 24.36% | 0.770 | 24.00% | 0.7588 | Tin (Sn) | 7440-31-5 | 98.50% | SAC105 |
| | | | 0.24% | 0.0077 | Silver (Ag) | 7440-22-4 | 1.00% | |
| | | | 0.12% | 0.0039 | Copper (Cu) | 7440-50-8 | 0.50% | |
| **BSP** | 4.25% | 0.134 | 2.72% | 0.0860 | Polyethylene terephthalate | 25038-59-9 | 64.00% | Adwill LC 2850 |
| | | | 1.02% | 0.0323 | Silica | 60676-86-0 | 24.00% | |
| | | | 0.21% | 0.0067 | Epoxy resin | - | 5.00% | |
| | | | 0.21% | 0.0067 | Acrylic polymer | - | 5.00% | |
| | | | 0.09% | 0.0027 | Carbon black | 1333-86-4 | 2.00% | |

**Notes:**
The values listed above are nominal values based on studies of representatives of this particular package type, and are believed to be as accurate as possible.
Constituent substances and proportions in epoxy materials are before curing.
The information provided above is representative of the package as of the date listed, and is subject to change at any time.
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Rev. B

# Device Material Content

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

**April, 2018**

**Package:** 25 WLCSP
**Total Device Weight** 12.371 **Milligrams**

**Package Code:** UWG25
**Products:** XO2-1200ZE

Assembly: ATT
Size (mm): 2.5 x 2.5
Lead pitch (mm): 0.4
MSL: 1
Reflow max (ºC): 260

| | % of Total Pkg. Wt. | Weight (mg) | % of Total Pkg. Wt. | Weight (mg) | Substance | CAS # | % of Subst. | Notes / Assumptions: |
|---|---|---|---|---|---|---|---|---|
| **Die** | 85.44% | 10.570 | 85.44% | 10.5698 | Silicon chip | 7440-21-3 | 100.00% | Die size: 2.5 x 2.5 mm |
| **UBM** | 0.80% | 0.099 | 0.80% | 0.0990 | Copper (Cu) | 7440-50-8 | 100.00% | |
| **Polymide 1** | 0.42% | 0.052 | 0.147% | 0.018185 | Polyamide | - | 35.00% | PBO HD8820 |
| | | | 0.202% | 0.024940 | Gamma-butyrolactone | 96-48-0 | 48.00% | |
| | | | 0.017% | 0.002078 | Propylene Glycol Monomethyl Ether Acetate | 108-65-6 | 4.00% | |
| | | | 0.055% | 0.006755 | Proprietary ingredients | - | 13.00% | |
| **RDL** | 0.63% | 0.078 | 0.63% | 0.0779 | Copper (Cu) | 7440-50-8 | 100.00% | |
| **RDL Sputter** | 0.05% | 0.006 | 0.004% | 0.000479 | Titanium (Ti) | 7440-32-6 | 7.74% | |
| | | | 0.046% | 0.005707 | Copper (Cu) | 7440-50-8 | 92.26% | |
| **Polymide 2** | 0.36% | 0.045 | 0.13% | 0.015587 | Polyamide | - | 35.00% | PBO HD8820 |
| | | | 0.17% | 0.021377 | Gamma-butyrolactone | 96-48-0 | 48.00% | |
| | | | 0.01% | 0.001781 | Propylene Glycol Monomethyl Ether Acetate | 108-65-6 | 4.00% | |
| | | | 0.05% | 0.005790 | Proprietary ingredients | - | 13.00% | |
| **Solder Balls** | 12.30% | 1.522 | 11.75% | 1.45316 | Tin (Sn) | 7440-31-5 | 95.50% | SAC405 |
| | | | 0.49% | 0.06087 | Silver (Ag) | 7440-22-4 | 4.00% | |
| | | | 0.06% | 0.00761 | Copper (Cu) | 7440-50-8 | 0.50% | |

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