## Device Material Content

<table>
<thead>
<tr>
<th>Package</th>
<th>49 WLCSP</th>
<th>Package Code: UWG49</th>
<th>Assembly: ASEK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reflow max (ºC): 260</td>
<td>Load pitch (mm): 0.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSL: 3</td>
<td>Size (mm): 3.158 x 3.046</td>
</tr>
</tbody>
</table>

### Total Device Weight
- **Weight (mg):** 12.14
- **% of Total Pkg. Wt.:** 9.46%

### Lead Pitch
- **Size (mm):** 3.158 x 3.046
- **Lead pitch (mm):** 0.4

### Notes / Assumptions:
- The size: 3.106 x 3.185 mm

### Die
- **Weight (mg):** 7.2169
- **% of Total Pkg. Wt.:** 59.46%
- **Substance:** Silicon chip
- **CAS #:** 7440-21-3
- **% of Subst.:** 100.00%

### Polymide (Repassivation)
- **Weight (mg):** 0.2342
- **% of Total Pkg. Wt.:** 1.93%
- **Substances:** 4-Butylolactone, Polyamide, 1-Methoxy-2-propyl acetate, Photo Active Compound, Proprietary Additives
- **CAS #:** 96-48-0, 108-65-6, 109-06-7, 99-17-0, -
- **% of Subst.:** 50.00%, 35.00%, 3.00%, 5.00%, -

### RDL(1) metalization
- **Weight (mg):** 0.0049
- **% of Total Pkg. Wt.:** 0.04%
- **Substance:** Titanium (Ti)
- **CAS #:** 7440-32-6
- **% of Subst.:** 100.00%

### RDL(2) metalization
- **Weight (mg):** 0.4118
- **% of Total Pkg. Wt.:** 3.45%
- **Substances:** Copper (Cu)
- **CAS #:** 7440-50-8
- **% of Subst.:** 100.00%

### UBM (1)
- **Weight (mg):** 0.0049
- **% of Total Pkg. Wt.:** 0.04%
- **Substance:** Titanium (Ti)
- **CAS #:** 7440-32-6
- **% of Subst.:** 100.00%

### UBM (2)
- **Weight (mg):** 0.8473
- **% of Total Pkg. Wt.:** 6.98%
- **Substances:** Copper (Cu)
- **CAS #:** 7440-50-8
- **% of Subst.:** 100.00%

### Solder Balls
- **Weight (mg):** 2.8496
- **% of Total Pkg. Wt.:** 24.30%
- **Substances:** Tin (Sn), Silver (Ag), Copper (Cu)
- **CAS #:** 7440-31-5, 7440-22-4, 7440-50-8
- **% of Subst.:** 95.50%, 4.00%, 0.50%

### BSC (coating film)
- **Weight (mg):** 0.4665
- **% of Total Pkg. Wt.:** 3.81%
- **Substances:** Polybutylene terephthalate (PBT), Silica, Other Epoxy resins, Other Acrylic resins, Carbon black
- **CAS #:** 25038-59-9, 60676-86-0, -,-, -
- **% of Subst.:** 65.00%, 19.50%, 7.50%, 7.50%, 0.50%

### 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.

---

**www.latticesemi.com**

**PCN#09A-19**

**Rev. F1**
### Device Material Content

<table>
<thead>
<tr>
<th>Device Material</th>
<th>% of Total Weight</th>
<th>Weight (mg)</th>
<th>% of Total Package Weight</th>
<th>Weight (mg)</th>
<th>Substance</th>
<th>CAS #</th>
<th>% of Subst.</th>
<th>Notes / Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Die</strong></td>
<td>82.67%</td>
<td>16.9682</td>
<td>82.67%</td>
<td>16.9682</td>
<td>Silicon chip</td>
<td>7440-21-3</td>
<td>100.00%</td>
<td>Die size: 3.106 x 3.185 mm</td>
</tr>
<tr>
<td><strong>Sputter 1</strong></td>
<td>0.00%</td>
<td>0.0123</td>
<td>0.005%</td>
<td>0.0010</td>
<td>Titanium (Ti)</td>
<td>7440-32-6</td>
<td>7.74%</td>
<td>Ti &amp; Cu</td>
</tr>
<tr>
<td><strong>Polyimide 1 (Repassivation)</strong> (PBO 1)</td>
<td>0.41%</td>
<td>0.0842</td>
<td>0.205%</td>
<td>0.0421</td>
<td>4-Butyrolactone</td>
<td>96-48-0</td>
<td>50.00%</td>
<td>PBO HD8820</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.144%</td>
<td>0.0295</td>
<td>Polyamide</td>
<td>7440-22-4</td>
<td>35.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>1-Methoxy-2-propl acetate</td>
<td>108-65-6</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>Photo Active Compound</td>
<td>-</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>Proprietary Additives</td>
<td>-</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td><strong>RDL(1) metalization</strong></td>
<td>0.72%</td>
<td>0.1478</td>
<td>0.72%</td>
<td>0.1478</td>
<td>Copper (Cu)</td>
<td>7440-50-8</td>
<td>100.00%</td>
<td>TiW &amp; Cu</td>
</tr>
<tr>
<td><strong>Sputter 2</strong></td>
<td>0.07%</td>
<td>0.0144</td>
<td>0.09%</td>
<td>0.0123</td>
<td>Ti/W</td>
<td>7440-32-6</td>
<td>49.82%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>11.20%</td>
<td>1.5022</td>
<td>Copper (Cu)</td>
<td>7440-50-8</td>
<td>50.18%</td>
<td></td>
</tr>
<tr>
<td><strong>Polyimide 2 (Repassivation)</strong> (PBO 2)</td>
<td>0.41%</td>
<td>0.0842</td>
<td>0.205%</td>
<td>0.0421</td>
<td>4-Butyrolactone</td>
<td>96-48-0</td>
<td>50.00%</td>
<td>PBO HD8820</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.144%</td>
<td>0.0295</td>
<td>Polyamide</td>
<td>7440-22-4</td>
<td>35.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>1-Methoxy-2-propl acetate</td>
<td>108-65-6</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>Photo Active Compound</td>
<td>-</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.021%</td>
<td>0.0042</td>
<td>Proprietary Additives</td>
<td>-</td>
<td>5.00%</td>
<td></td>
</tr>
<tr>
<td><strong>UBM</strong></td>
<td>0.84%</td>
<td>0.1724</td>
<td>0.840%</td>
<td>0.1724</td>
<td>Copper (Cu)</td>
<td>7440-50-8</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td><strong>Solder Balls</strong></td>
<td>14.82%</td>
<td>3.0418</td>
<td>14.15%</td>
<td>2.9050</td>
<td>Tin (Sn)</td>
<td>7440-31-5</td>
<td>95.50%</td>
<td>SAC 405</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.59%</td>
<td>0.1217</td>
<td>Silver (Ag)</td>
<td>7440-22-4</td>
<td>4.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.07%</td>
<td>0.0152</td>
<td>Copper (Cu)</td>
<td>7440-50-8</td>
<td>0.50%</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Notes 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.

---

Rev. E  
www.latticesemi.com