## Device Material Content

**Package:** 484 fpBGA

**Total Device Weight:** 2.214 Grams

<table>
<thead>
<tr>
<th>Package Code:</th>
<th>FN484</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly:</td>
<td>ASEM</td>
</tr>
<tr>
<td>Size (mm):</td>
<td>23 x 23</td>
</tr>
<tr>
<td>Lead pitch (mm):</td>
<td>1.0</td>
</tr>
<tr>
<td>MSL:</td>
<td>3</td>
</tr>
<tr>
<td>Reflow max (ºC):</td>
<td>250</td>
</tr>
</tbody>
</table>

### Die
- **Weight (g):** 0.0219
- **% of Total Pkg. Wt.:** 0.99%
- **% of Total Weight:** 0.99%
- **Substance:** Silicon chip
- **CAS #:** 7440-21-3
- **% of Subst.:** 100.00%
- **Notes / Assumptions:** Die size: 5.66 x 6.71mm

### Mold Compound
- **Weight (g):** 0.7604
- **% of Total Pkg. Wt.:** 34.35%
- **% of Total Weight:** 2.23%
- **Substance:** Epoxy Resin
- **CAS #:** 9003-35-4
- **% of Subst.:** 6.50%
- **Notes / Assumptions:** Mold Compound: Sumitomo G750SE

### D/A Epoxy
- **Weight (g):** 0.0032
- **% of Total Pkg. Wt.:** 0.14%
- **% of Total Weight:** 0.12%
- **Substance:** Silver
- **CAS #:** 7440-22-4
- **% of Subst.:** 80.00%
- **Notes / Assumptions:** Die attach epoxy: Henkel (Ablebond) 2100A

### Wire
- **Weight (g):** 0.0050
- **% of Total Pkg. Wt.:** 0.22%
- **% of Total Weight:** 0.22%
- **Substance:** Copper
- **CAS #:** 7440-50-8
- **% of Subst.:** 98.55%
- **Notes / Assumptions:** 0.8 mil diameter; 1 wire per solder ball

### Solder Balls
- **Weight (g):** 0.4696
- **% of Total Pkg. Wt.:** 21.21%
- **% of Total Weight:** 20.47%
- **Substance:** Tin (Sn)
- **CAS #:** 7440-31-5
- **% of Subst.:** 96.50%

### Substrate
- **Weight (g):** 0.4460
- **% of Total Pkg. Wt.:** 20.15%
- **% of Total Weight:** 6.45%
- **Substance:** BT Resins
- **CAS #:** 65997-17-3
- **% of Subst.:** 32.00%

### Foil
- **Weight (g):** 0.4053
- **% of Total Pkg. Wt.:** 18.31%
- **% of Total Weight:** 16.70%
- **Substance:** Copper
- **CAS #:** 7440-50-8
- **% of Subst.:** 91.18%

### Solder Mask
- **Weight (g):** 0.1021
- **% of Total Pkg. Wt.:** 4.61%
- **% of Total Weight:** 2.59%
- **Substance:** Quartz
- **CAS #:** 14808-60-7
- **% of Subst.:** 56.20%

---

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.

www.latticesemi.com
### Device Material Content

**Package:** 484 fpBGA  
**Total Device Weight:** 2.214 Grams  
**Package Code:** FN484  
**Products:** FE2, FE3, XP2  
**Assembly:** ASEK  
**Size (mm):** 23 x 23  
**Lead pitch (mm):** 1.0  
**Reflow max (°C):** 250  
**MSL:** 3

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (g)</th>
<th>% of Total Pkg. Wt.</th>
<th>Weight (g)</th>
<th>% of Total Pkg. Wt.</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></td>
<td>0.99%</td>
<td>0.99%</td>
<td>0.0219</td>
<td>Silicon chip</td>
<td>7440-21-3</td>
<td>100.00%</td>
<td>Die size: 5.66 x 6.71mm</td>
</tr>
<tr>
<td><strong>Mold Compound</strong></td>
<td></td>
<td>34.35%</td>
<td>0.0380</td>
<td>0.0072</td>
<td>Epoxy Resin</td>
<td>7440-21-3</td>
<td>5.00%</td>
<td>Mold Compound: Hitachi CEL-9750ZHF10AKL-U</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0380</td>
<td>0.00015</td>
<td>0.0016</td>
<td>Phenol Resin</td>
<td>1333-86-4</td>
<td>0.20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.015</td>
<td>0.1666</td>
<td>0.0313</td>
<td>Carbon Black</td>
<td>60676-86-0</td>
<td>87.80%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.69%</td>
<td>0.0152</td>
<td>0.0048</td>
<td>Silica</td>
<td>60676-86-0</td>
<td>87.80%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.69%</td>
<td>0.0152</td>
<td>0.0048</td>
<td>Others</td>
<td>-</td>
<td>2.00%</td>
<td></td>
</tr>
<tr>
<td><strong>D/A Epoxy</strong></td>
<td>0.14%</td>
<td>0.0032</td>
<td>0.0255</td>
<td>0.0048</td>
<td>Silver</td>
<td>7440-50-8</td>
<td>98.55%</td>
<td>Die attach epoxy: Henkel (Ablebond) 2100A</td>
</tr>
<tr>
<td></td>
<td>0.12%</td>
<td>0.0064</td>
<td>0.00015</td>
<td>0.0001</td>
<td>Esters &amp; resins</td>
<td>7440-22-4</td>
<td>80.00%</td>
<td></td>
</tr>
<tr>
<td><strong>Wire</strong></td>
<td>0.22%</td>
<td>0.0050</td>
<td>0.0001</td>
<td>0.0001</td>
<td>Copper</td>
<td>7440-50-8</td>
<td>98.55%</td>
<td>0.8 mil diameter; 1 wire per solder ball</td>
</tr>
<tr>
<td></td>
<td>0.22%</td>
<td>0.0050</td>
<td>0.0001</td>
<td>0.0001</td>
<td>Palladium</td>
<td>7440-50-8</td>
<td>98.55%</td>
<td></td>
</tr>
<tr>
<td><strong>Solder Balls</strong></td>
<td>21.21%</td>
<td>0.4696</td>
<td>0.4531</td>
<td>0.1000</td>
<td>Tin (Sn)</td>
<td>7440-31-5</td>
<td>96.50%</td>
<td>Ag 3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0164</td>
<td>0.0164</td>
<td>0.0004</td>
<td>Silver (Ag)</td>
<td>7440-22-4</td>
<td>3.50%</td>
<td></td>
</tr>
<tr>
<td><strong>Substrate</strong></td>
<td>20.15%</td>
<td>0.4460</td>
<td>0.5312</td>
<td>0.3033</td>
<td>BT Resins</td>
<td>65997-17-3</td>
<td>68.00%</td>
<td>BT Resin CCL-HL832NX-A</td>
</tr>
<tr>
<td></td>
<td>6.15%</td>
<td>0.1427</td>
<td>0.3033</td>
<td>0.3033</td>
<td>Glass fiber</td>
<td>-</td>
<td>32.00%</td>
<td></td>
</tr>
<tr>
<td><strong>Foil</strong></td>
<td>18.31%</td>
<td>0.4053</td>
<td>0.3696</td>
<td>0.0800</td>
<td>Copper</td>
<td>7440-50-8</td>
<td>91.18%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.54%</td>
<td>0.0340</td>
<td>0.0001</td>
<td>0.0001</td>
<td>Nickel plating</td>
<td>7440-02-0</td>
<td>8.40%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.08%</td>
<td>0.0017</td>
<td>0.0017</td>
<td>0.0017</td>
<td>Gold plating</td>
<td>7440-57-5</td>
<td>0.42%</td>
<td></td>
</tr>
<tr>
<td><strong>Solder Mask</strong></td>
<td>4.61%</td>
<td>0.1021</td>
<td>0.0574</td>
<td>0.1016</td>
<td>Quartz</td>
<td>14808-60-7</td>
<td>56.20%</td>
<td>Solder mask PSR4000 AUS 3 Mbps</td>
</tr>
<tr>
<td></td>
<td>0.74%</td>
<td>0.0163</td>
<td>0.0163</td>
<td>0.0163</td>
<td>3-methoxy-3-methylbutylacetate</td>
<td>103429-99-9</td>
<td>16.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.01%</td>
<td>0.0022</td>
<td>0.0022</td>
<td>0.0022</td>
<td>Barium Sulfate</td>
<td>7727-43-7</td>
<td>22.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.14%</td>
<td>0.0031</td>
<td>0.0031</td>
<td>0.0031</td>
<td>Talc</td>
<td>14807-96-6</td>
<td>3.00%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.02%</td>
<td>0.0005</td>
<td>0.0005</td>
<td>0.0005</td>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>0.50%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.11%</td>
<td>0.0023</td>
<td>0.0023</td>
<td>0.0023</td>
<td>Trade secret ingredients</td>
<td>-</td>
<td>3.00%</td>
<td></td>
</tr>
</tbody>
</table>

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.