Endura® Avenir™ RF PVD NiPt
Enabling Advanced Silicides

March 17, 2011
Silicon Systems Group Overview

- #1 in the Wafer Fab Equipment (WFE) and advanced packaging markets

- In 2011, expect to grow WFE market share for the 3rd consecutive year

- Growth fueled by new product innovations aligned to technology inflections

Source: Gartner, April 2010
Endura Avenir RF PVD Ni(Pt) adds to Applied’s front end metals portfolio
Logic Silicide Challenge

- Conventional salicide scheme changing to through-contact silicidation
- Aspect ratio increasing for successive nodes
RF PVD NiPt Chamber Technology

RF PVD chamber developed to address critical front end metal requirements

<table>
<thead>
<tr>
<th>Key Requirements</th>
<th>Chamber Technology</th>
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<tbody>
<tr>
<td>Productivity</td>
<td>Magnetron / Process Kit</td>
</tr>
<tr>
<td>Bottom Coverage</td>
<td>RF Plasma / Magnetron</td>
</tr>
<tr>
<td>Low Plasma Damage</td>
<td>RF Plasma</td>
</tr>
<tr>
<td>Uniformity</td>
<td>RF/DC, Magnetron / Process Kit</td>
</tr>
</tbody>
</table>
# Avenir RF PVD: High Bottom Coverage

<table>
<thead>
<tr>
<th>Metric</th>
<th>ALPS ESI</th>
<th>Avenir RF PVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionization</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Bottom Coverage</td>
<td><img src="image" alt="BC=32%" /></td>
<td><img src="image" alt="BC=80%" /></td>
</tr>
<tr>
<td>Productivity</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

Avenir RF PVD chamber meets technology and productivity requirements for logic silicides.
How Does RF PVD Benefit Customers?

RF PVD produces uniform bottom coverage → uniform silicide formation

RF PVD NiPt technology reduces feature dependence of bottom coverage and enables extendibility with up to 30% lower CoC
RF PVD NiPt Adds Logic Silicide to Applied’s Suite of Avenir RF PVD Chambers

- Integrated Siconi, silicide, capping solution on Endura has been the industry standard since 65nm
- Avenir RF PVD NiPt enables through-contact logic silicides for <22nm
- RF/DC sputtering results in 2X improvement in bottom coverage and lower CoC
- Selected by leading customers for <22nm logic silicides

Endura Avenir RF PVD extends Applied’s transistor leadership to ≤22nm
Turning innovations into industries.