January 2019

Semiconductors and Made in China 2025

Dan Wang
The semiconductor gap

Domestic Chinese companies supply mostly low-end technologies

PwC, Wind, Gavekal Data/Macrobond
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<tr>
<td></td>
<td></td>
<td>全球集成电路市场规模为2805亿～3352亿美元，复合增长率为5.3%</td>
<td>全球集成电路市场规模为5361亿～6406亿美元，复合增长率为5.5%</td>
<td>全球集成电路市场规模为4000亿～5375亿美元，复合增长率为5%</td>
<td>全球集成电路市场规模为4500亿～6000亿美元，复合增长率为5.5%</td>
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<td>中国集成电路市场规模为1215亿～1400亿美元，复合增长率为26.4%占全球市场规模占比为53%</td>
<td>中国集成电路市场规模为1805亿～2468亿美元，复合增长率为25.1%占全球市场规模占比为60%</td>
<td>中国集成电路市场规模为2528亿～3814亿美元，复合增长率为4.2%占全球市场规模占比为70%</td>
<td>中国集成电路市场规模为3050亿～4500亿美元，复合增长率为3.6%占全球市场规模占比为80%</td>
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<td>本地产值为241亿～344亿美元，复合增长率为15.8%，具有满足国内市场需求33%的供给能力</td>
<td>本地产值为531亿～1400亿美元，复合增长率为16.5%，具有满足国内市场需求58%的供给能力</td>
<td>本地产值为1502亿～3651亿美元，复合增长率为7.3%，具有满足国内市场80%的供给能力</td>
<td>本地产值为2040亿～4500亿美元，复合增长率为5.5%，具有满足国内市场80%的供给能力</td>
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<td>满足国家安全和战略领域应用需求</td>
<td>占领战略型产品市场</td>
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<td>产业规模达到2914亿～4444亿美元，全球市场占比达到63%，中国市场占比达到54%</td>
<td>产业规模达到6531亿～1600亿美元，全球市场占比达到64%，中国市场占比达到58%</td>
<td>产业规模达到1502亿～3951亿美元，全球市场占比达到56%，中国市场占比达到80%</td>
<td>产业规模达到2040亿～4500亿美元，全球市场占比达到50%，中国市场占比达到80%</td>
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<td>各类集成电路龙头电子产品进入全球前60位，市场价格占全球市场份额30%以上，实现可持续发展</td>
<td>各类集成电路龙头龙头企业产品进入全球前60位，在竞争中稳步发展</td>
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<td>65～40nm制造技术</td>
<td>28nm制造技术</td>
<td>20～14nm制造技术</td>
<td>20～14nm制造技术</td>
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<td>制造产能达20百万片/月（12寸）</td>
<td>制造产能达70百万片/月（12寸）</td>
<td>制造产能达100百万片/月（12寸）</td>
<td>制造产能达150百万片/月（12寸）</td>
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<td>28nm</td>
<td>20～14nm</td>
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<td>20nm</td>
<td>20～14nm</td>
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<td>20nm</td>
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<td>设计业产值500亿美元，全球占比达25%</td>
<td>设计业产值400亿美元，全球占比达25%</td>
<td>设计业产值600亿美元，全球占比达25%</td>
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<td>集成电路设计业产值100亿美元，全球占比达35%</td>
<td>集成电路设计业产值200亿美元，全球占比达40%</td>
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<td></td>
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<td>MCP（多芯片封装）</td>
<td>3D Package</td>
<td>MCO（多元封装芯片）</td>
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<tr>
<td></td>
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<td>HK金属及SiGe/SiC应力</td>
<td>FireFET</td>
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<td>多次曝光</td>
<td>多次曝光</td>
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<td></td>
<td>12寸晶片</td>
<td>EUV</td>
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<td>19mm光刻技术</td>
<td>EUV光刻技术</td>
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<td>65～32nm光刻技术</td>
<td>20～14nm光刻技术及成套技术</td>
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<td>先进光刻技术</td>
<td>先进光刻技术及成套技术</td>
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<td>后加工精密研磨技术</td>
<td>后加工精密研磨技术及成套技术</td>
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图1-1 集成电路及专用设备技术路线图

**Gavekal Dragonomics**
China is now the center of electronics production and consumption

**Chinese phonemakers now have significant global market share**

Global smartphone shipments, by country of brand headquarters

- China share of total (rhs)
- Other (lhs)
- Korea (lhs)
- USA (lhs)
- China (lhs)

Units, billion


% market share

IDC, Gavekal Data/Macrobond
Moore’s Law is slowing down and getting more expensive
Smaller may not always be better
Big spender

China is spending big on semiconductor equipment for new fabs

Expected semiconductor equipment spending, 2017-20

USD, billion

Korea  China  Taiwan  Japan  Americas  Europe

World Fab Forecast, SEMI, Gavekal Data/Macrobond
The risk to my cautiously optimistic view: export controls
Base case: export controls won’t be too severe

**China is a huge customer for US chips companies**

Percentage of sales in China, 2017

<table>
<thead>
<tr>
<th>Company</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Qualcomm</td>
<td>60-70</td>
</tr>
<tr>
<td>Broadcom</td>
<td>40-50</td>
</tr>
<tr>
<td>Marvell</td>
<td>30-40</td>
</tr>
<tr>
<td>Micron</td>
<td>20-30</td>
</tr>
<tr>
<td>Texas Instruments</td>
<td>10-20</td>
</tr>
<tr>
<td>AMD</td>
<td>0-10</td>
</tr>
<tr>
<td>Intel</td>
<td>0-10</td>
</tr>
<tr>
<td>Nvidia</td>
<td>0-10</td>
</tr>
<tr>
<td>Applied Materials</td>
<td>0-10</td>
</tr>
<tr>
<td>Lam Research</td>
<td>0-10</td>
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<tr>
<td>KLA-Tencor</td>
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Bloomberg, Gavekal Data/Macrobond
Contact and disclaimer

Thank you.

This presentation was prepared by
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