2009 EE Times-China IC Design House Survey
Methodology

In June 2009, EE Times-China conducted an online and phone survey among a universe of 419 companies in mainland China involved in IC design.

The objective of the research was to describe the current business operations of these companies and the current level of design complexity utilized.

A total of 162 surveys were completed, resulting in a sample of 37%.
Respondent profile
51% perform design & development and engineering management job functions

- Design & development: 40%
- Corporate management: 43%
- Engineering management: 11%
- Test & Measurement Engineering: 4%
- Others: 2%
Business operations
Respondent companies offer a variety of products and services

- Full system design: 59%
- Intellectual Property: 32%
- Technical training: 20%
- Testing services: 17%
- Foundry services: 9%
- Packaging services: 5%
- Others: 4%

*Multiple responses allowed*
They employ an average 111 personnel

- 20 or less: 6%
- 21 to 40: 17%
- 41 to 70: 17%
- 101 to 200: 14%
- 201 to 400: 12%
- More than 400: 17%
- 71 to 100: 17%
- 41 to 70: 17%

www.eetchina.com
On average, they have 63 IC designers
49% of respondent companies are pure local companies

- Locally invested: 49%
- Overseas technology venture: 7%
- Overseas joint venture: 24%
- Overseas subsidiary: 20%
87% employ foundry services
Of which 87% are based locally

- Mainland China: 87%
- Taiwan: 59%
- Singapore: 14%
- Japan: 9%
- United States: 9%
- South Korea: 6%
- Others: 5%

*Multiple responses allowed*
Main difficulties when contracting foundries

- Cost: 64%
- Cycle times: 60%
- Incompatible process technology: 25%
- Substandard fabrication quality: 18%
- Inadequate production capacity: 18%
- Inadequate volume: 16%
- Communication with foundry: 11%
- Substandard testing: 9%
- Others: 4%

*Multiple responses allowed*
81% market own-brand ICs
87% sell own-brand ICs via direct sales
Respondents use wide-ranging channels to promote their products/services

- Direct marketing: 74%
- Own website: 71%
- Customer referrals: 64%
- Trade shows: 58%
- Industry websites: 41%
- Ads in trade magazines: 36%
- Conferences: 34%
- Distributor website: 28%
- Others: 5%

*Multiple responses allowed*
The design process
Respondent companies are primarily involved in ASIC designs

- ASIC: 62%
- SoC: 55%
- Standard IC: 44%
- PLD/FPGA-based: 18%
- MCM/SiP: 17%
- ASSP: 7%
- Others: 12%

*Multiple responses allowed*
They develop a variety of analog/mixed-signal IC designs

<table>
<thead>
<tr>
<th>Analog/mixed-signal IC type</th>
<th>% 2009</th>
<th>% to develop by 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog ASICs</td>
<td>36%</td>
<td>19%</td>
</tr>
<tr>
<td>Power management ICs</td>
<td>36%</td>
<td>20%</td>
</tr>
<tr>
<td>Driver/controller ICs</td>
<td>30%</td>
<td>17%</td>
</tr>
<tr>
<td>ADCs/DACs/Data acquisition ICs</td>
<td>25%</td>
<td>11%</td>
</tr>
<tr>
<td>Transmitter/receiver/transceiver ICs</td>
<td>24%</td>
<td>14%</td>
</tr>
<tr>
<td>Embedded MCU with A/MS functions</td>
<td>22%</td>
<td>11%</td>
</tr>
<tr>
<td>Comparators/sense amplifiers</td>
<td>14%</td>
<td>5%</td>
</tr>
<tr>
<td>Embedded processors with A/MS functions</td>
<td>13%</td>
<td>9%</td>
</tr>
<tr>
<td>Optoelectronics ICs</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Power conversion/regulation ICs</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Tuner ICs</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Power amplifier ICs</td>
<td>6%</td>
<td>7%</td>
</tr>
<tr>
<td>Line-driver ICs</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Preamplifier ICs</td>
<td>6%</td>
<td>1%</td>
</tr>
<tr>
<td>Filter ICs</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Video amplifier ICs</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Other analog/mixed-signal ICs</td>
<td>22%</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Multiple responses allowed
As well as a variety of digital IC designs

<table>
<thead>
<tr>
<th>Digital IC type</th>
<th>% 2009</th>
<th>% to develop by 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital ASICs</td>
<td>39%</td>
<td>24%</td>
</tr>
<tr>
<td>SoCs</td>
<td>34%</td>
<td>29%</td>
</tr>
<tr>
<td>Microcontrollers/embedded CPUs</td>
<td>19%</td>
<td>13%</td>
</tr>
<tr>
<td>Interface ICs</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>Multimedia ICs/chipsets</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Logic ICs</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td>DSPs</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Coprocessors/Application processors</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Memory ICs</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>I/O controllers</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Processors/CPUs</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Fax/Modem/Voice ICs/chipsets</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Graphics ICs/chipsets</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>Switch/Multiplexer ICs</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Gate arrays</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Computer chipsets</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>Other digital ICs</td>
<td>12%</td>
<td>7%</td>
</tr>
</tbody>
</table>

*Multiple responses allowed*
They design ICs for application in consumer electronics

- Cellphones: 50%
- Set-top boxes: 42%
- Portable media players: 42%
- GPS/PND: 40%
- **Netbook**: 39%
- Toys/games: 37%
- DVD players: 31%
- Television sets: 30%
- PDAs: 28%
- Digital cameras: 24%
- Others: 6%

*Multiple responses allowed*
For computers and peripherals

- Laptop / mobile computers: 28%
- Desktop computers: 22%
- Other office / business machines: 16%
- Printers / plotters: 10%
- Other computer-related applications: 20%

*Multiple responses allowed*
For telecommunication systems

- Wireless network equipment: 25%
- LAN/WAN equipment: 19%
- IP network equipment: 12%
- PSTN equipment: 10%
- Other telecom-related applications: 19%

*Multiple responses allowed*
And for other key applications

- Industrial controls: 23%
- Medical electronics: 20%
- Test & measurement: 16%
- Military electronics: 12%
- Automotive electronics: 4%

*Multiple responses allowed*
Respondent companies worked on an average of 9 design projects in 2008.
72% utilized 0.25µm or smaller process technology for digital design.
55% utilized 0.25µm or smaller process technology for analog design

- 0.5 to 1.5µm: 14%
- 0.35µm: 14%
- 0.25µm: 5%
- 0.18µm: 20%
- 0.13µm: 15%
- 0.11µm: 3%
- 90nm: 9%
- * 65nm and less: 3%
57% utilized 0.25µm or smaller process technology for mixed-signal design

- Greater than 1.5µm: 1%
- 0.5 to 1.5µm: 9%
- 0.35µm: 11%
- 0.25µm: 4%
- 0.18µm: 17%
- 0.13µm: 18%
- 0.11µm: 3%
- 90nm: 11%
- *65nm and less: 4%
PLD/FPGA-based design by gate count

<table>
<thead>
<tr>
<th>Gate Count Range</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10,000</td>
<td>9%</td>
</tr>
<tr>
<td>10,000 – 29,999</td>
<td>6%</td>
</tr>
<tr>
<td>30,000 – 49,000</td>
<td>6%</td>
</tr>
<tr>
<td>50,000 – 99,999</td>
<td>6%</td>
</tr>
<tr>
<td>100,000 – 249,999</td>
<td>4%</td>
</tr>
<tr>
<td>250,000 – 499,999</td>
<td>3%</td>
</tr>
<tr>
<td>500,000 – 999,999</td>
<td>4%</td>
</tr>
<tr>
<td>1 million and above</td>
<td>20%</td>
</tr>
</tbody>
</table>
## Challenges faced during the design process

<table>
<thead>
<tr>
<th>Design challenges</th>
<th>% of respondents</th>
<th>Design challenges</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design cycle time (reduction)</td>
<td>67%</td>
<td>Hardware/software co-design</td>
<td>7%</td>
</tr>
<tr>
<td>Cost (reduction) of design</td>
<td>64%</td>
<td>Timing closure</td>
<td>6%</td>
</tr>
<tr>
<td>Power management</td>
<td>15%</td>
<td>Analog Simulation (SPICE)</td>
<td>6%</td>
</tr>
<tr>
<td>IP availability</td>
<td>15%</td>
<td>Design for manufacture/Design for yield</td>
<td>6%</td>
</tr>
<tr>
<td>EMI</td>
<td>14%</td>
<td>Functional verification</td>
<td>5%</td>
</tr>
<tr>
<td>IP verification</td>
<td>14%</td>
<td>ASIC emulation/rapid prototyping</td>
<td>5%</td>
</tr>
<tr>
<td>IP Reuse</td>
<td>13%</td>
<td>Hardware/software co-verification</td>
<td>4%</td>
</tr>
<tr>
<td>Analog IC layout</td>
<td>12%</td>
<td>Design for test</td>
<td>4%</td>
</tr>
<tr>
<td>RF Design</td>
<td>11%</td>
<td>Physical verification</td>
<td>4%</td>
</tr>
<tr>
<td>Signal Integrity</td>
<td>11%</td>
<td>Device modeling</td>
<td>3%</td>
</tr>
<tr>
<td>Compatibility of design tools</td>
<td>8%</td>
<td>Logic synthesis</td>
<td>1%</td>
</tr>
<tr>
<td>Thermal management</td>
<td>8%</td>
<td>Behavioral simulation</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Multiple responses allowed*
Appendix
Extended analysis of China respondents using both distributors and direct sales

- 10% direct sales: 11%
- 20% direct sales: 11%
- 30% direct sales: 5%
- 40% direct sales: 2%
- 50% direct sales: 4%
- 60% direct sales: 7%
- 70% direct sales: 7%
- 80% direct sales: 12%
- 90% direct sales: 12%

Direct sales distribution ranges from 0% to 12%.