



CAST
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Agenda

- I. QCOM background**
- II. Market Conditions
- III. Global Suppliers
- IV. Data Integration
- V. Conclusion

QUALCOMM Incorporated

- Global leader in developing and delivering innovative digital wireless communications solutions based on CDMA and other advanced technologies.
- Partners with wireless operators, device manufacturers, independent software vendors, distribution suppliers and Fortune 1000-class corporations to drive adoption mobility solutions based on third-generation (3G) CDMA and other digital technologies.



- NASDAQ symbol: QCOM
- \$7.53 billion FY06 revenues
- Founded in 1985
- More than 11,200 employees in 51 worldwide locations
- 140+ CDMA licensees
- ~5,700 US patents (2,100 issued, 3,600 pending)
- ~35,000 foreign patents (8,000 issued, 27,000 pending)
- \$1.5 billion FY06 R&D expenditures
- Member of the S&P 500 Index
- "100 Best Managed Companies" - Industry Week
- "100 Best Companies to Work for in America" – FORTUNE
- Largest Fabless Semiconductor Company

Execution - Innovation - Partnerships

QCT is largest Fabless Semiconductor in the world!

CYQ2 Rank	CYQ1 Rank	Company	Country	Ticker	CYQ2 Revenue	CYQ1 Revenue
1	1	Qualcomm - QCT	USA	QCOM	\$1.8B	\$1.6B
2	3	Broadcom	USA	BRCM	\$1.2B	\$1.0B
3	2	NVIDIA	USA	NVDA	\$892.7M	\$1.2B
4	5	Marvell Technology Group	USA	MRVL	\$842.6M	\$804.1M
5	4	SanDisk	USA	SNDK	\$816.0M	\$850.0M
6	6	LSI Logic	USA	LSI	\$692.1M	\$660.7M
7	7	MediaTek	Taiwan	2454	\$543.6M	\$501.4M
8	8	Xilinx	USA	XLNX	\$488.2M	\$475.8M
9	9	Avago Technologies	USA	Private	\$439.0M	\$411.0M
10	10	Altera	USA	ALTR	\$359.9M	\$336.1M

Source: GSA (Global Semiconductor Alliance) - 1Q2008, 2Q2008

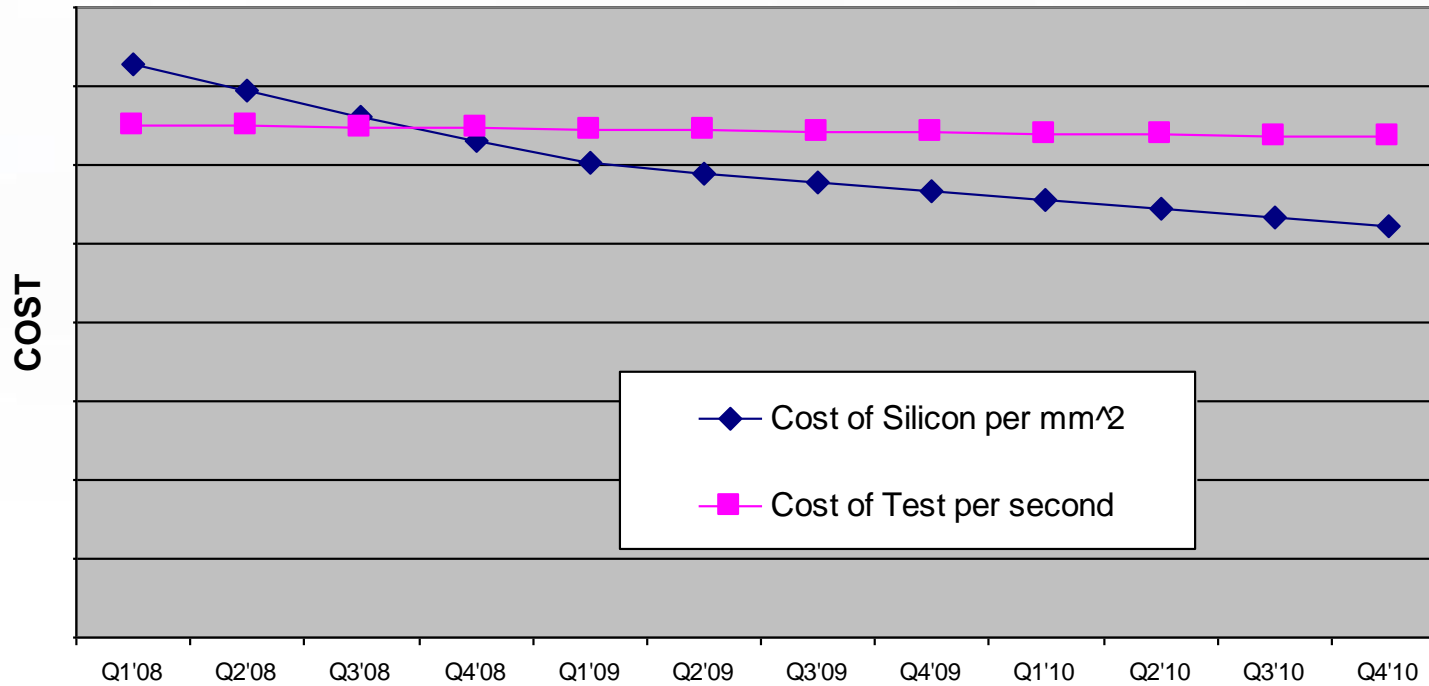
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- CDMA TAM is very large. Has attracted tremendous high caliber competition.
- ASP's have to continuously decrease.
- ATE CAPEX not keeping up with ASP decline
 - Need to make up gap with other innovations like loop back, MBIST, LBIST, adaptive testing and other DFT/DFM techniques. (Per Pin TIA example is a highlight though)
- Need to maintain Cost Of Test to <6% of raw silicon acquisition cost.
 - This is very challenging as you drive to deep sub-micron technologies and the cost of unit die decreases but complexity increases.

Based on 2007 cost model for 65nm devices

Cost of Silicon vs Cost of Test



Reducing cost of test, look at memory test model.

- Test 100's of parts in parallel. Currently 8x.
- ATE companies provide complete cell solution. Tester, Handler and Prober need to be looked at as a single test unit.

NOTE: DUE to device complexity, testers typically have more capacity than load boards (36 layers) and probe cards. THIS IS VERY INNEFICIENT.

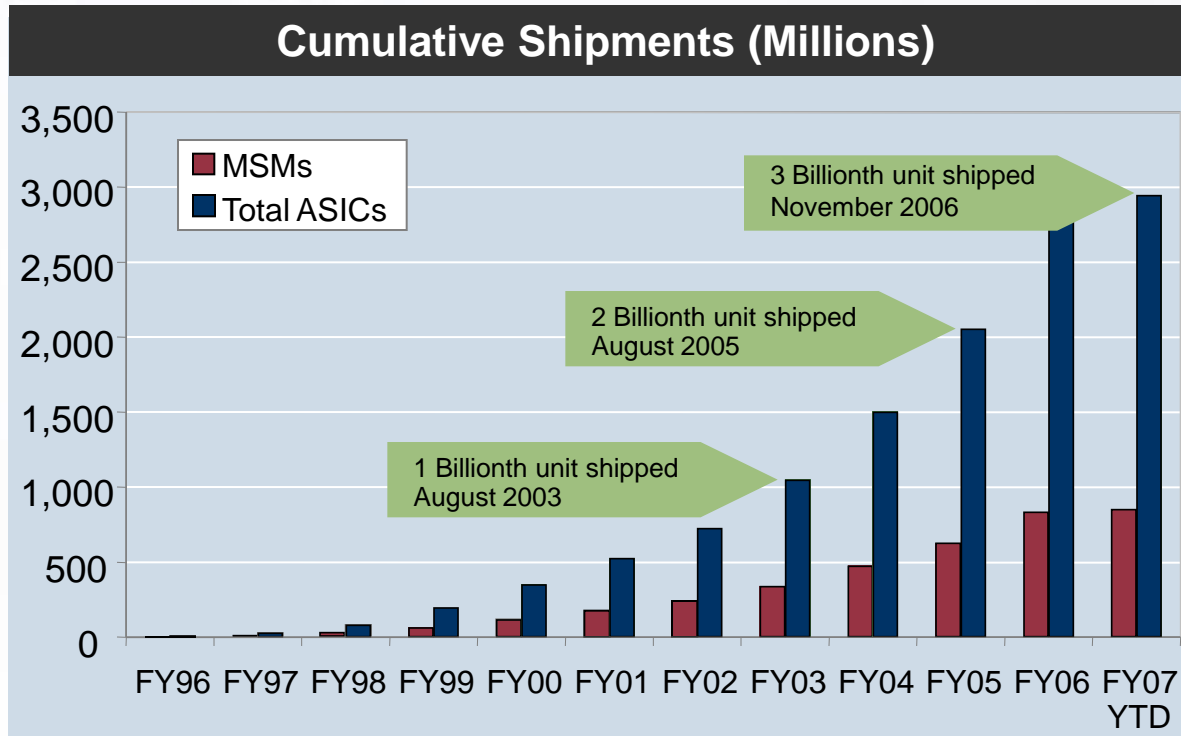
Yield is king.

- The next generation SOC tester needs to support yield learning activates “real time” with zero overhead.
- Time to yield is critical.
- QCOM & our Foundry partners have saved over \$50M with the help of hardware and software from Inovys.
- Need for ‘big iron’ SOC testers to move faster in this area.

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QUALCOMM Chip Shipments Total 3 Billion, as of Nov 2006



- 7 years for 1st Billion Chips
- 2 years for 2nd Billion Chips
- 15 months for 3rd Billion!!!

Global Diversification of Supplier Base

Key Suppliers	  
Ramping	  

- 2005 1 year plus from CS to 1M units
- 2006 9 months plus from CS to 1M units
- 2007 6 months plus from CS to 1M units
- 2008 3 months plus from CS to 1M units

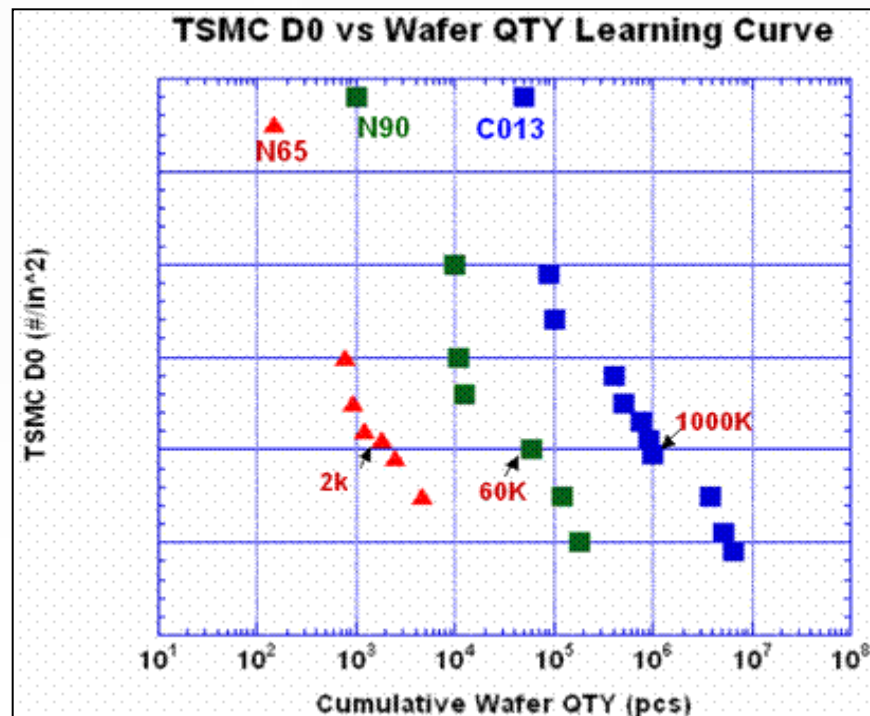
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QCOM & Foundry 65nm Success Story

Yield Learning & Reporting

QCOM developed Tools for locating physical defects that allowed us to reduce the number of wafers required for achieving target defect densities.



We Plan on Repeating the Success Story for 45nm!

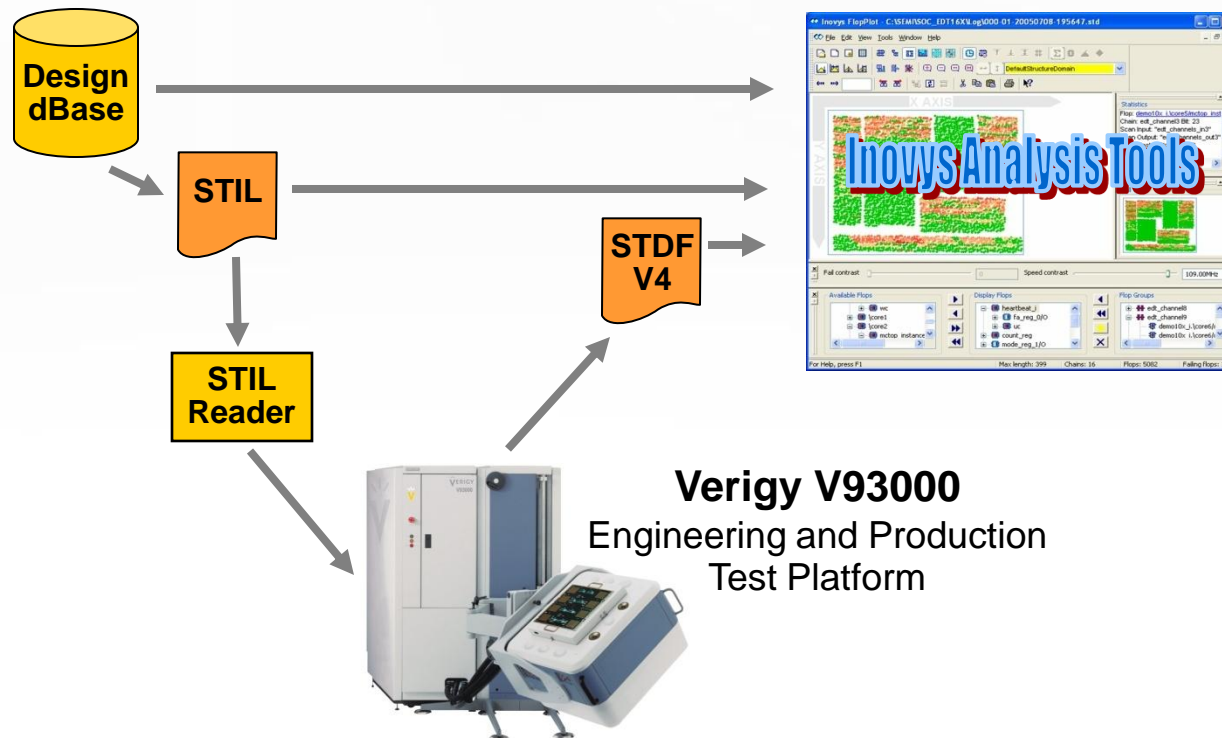
At ITC2006 QCOM (Mike Campbell) issued a public challenge to the test industry to deliver Logic Bitmaps.

In 2007, in a cooperative effort, Inovys and Verigy have delivered this.

The Inovys-Verigy combination maps electrical failures to physical locations on silicon.

This logic bitmap solution saves weeks on NPI through accelerated detection and diagnosis of systematic faults.

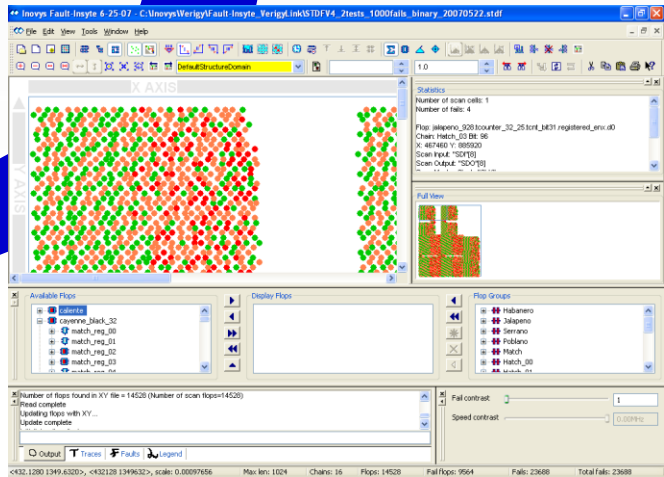
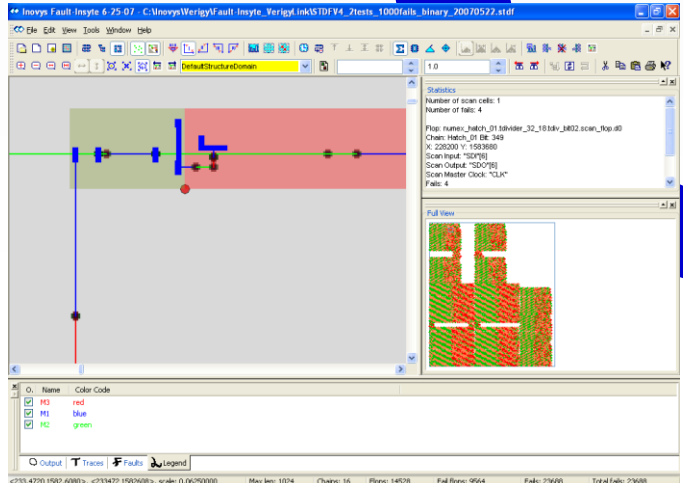
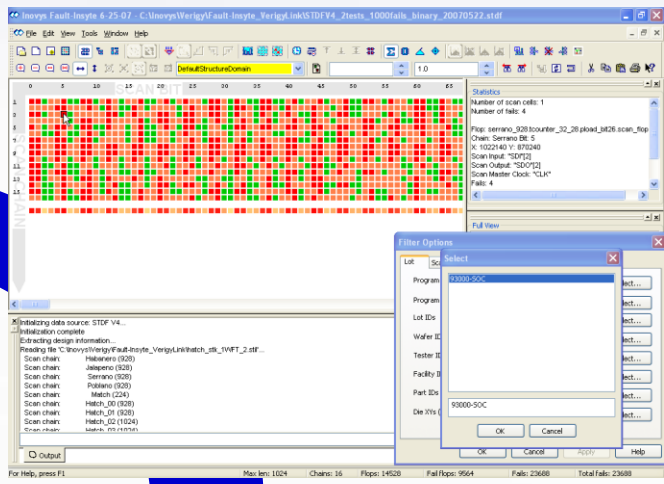
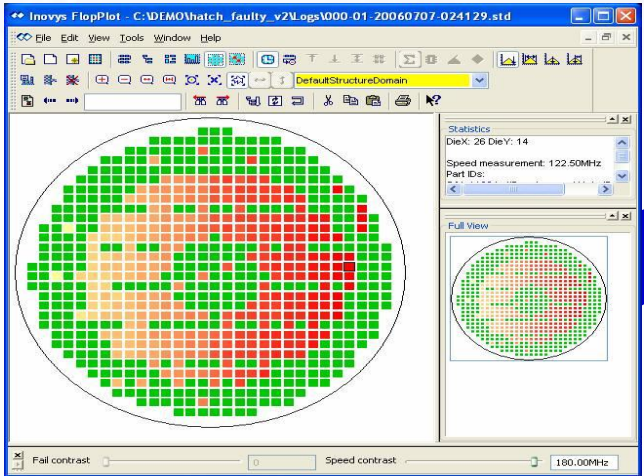
QCOM continues to work with other vendors as well.



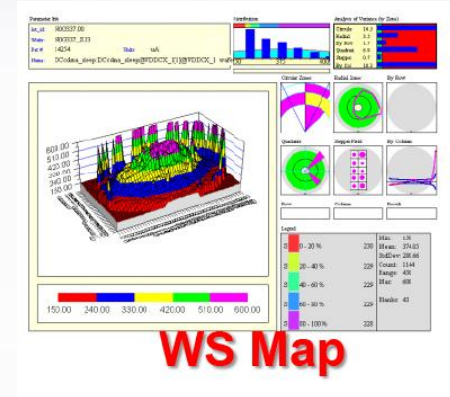
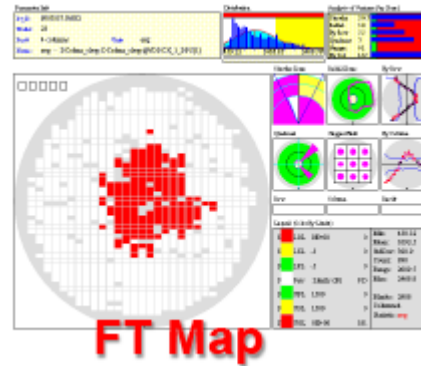
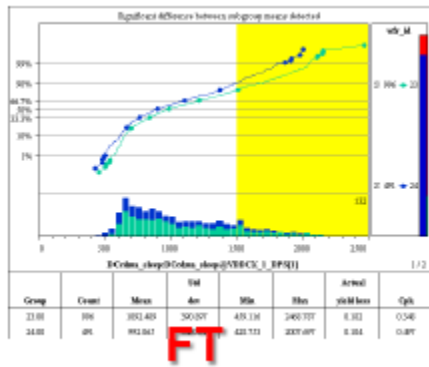
Wafer Map
Scan Map

Transforming Electrical Wafer Maps To Physical Die Locations

Physical View
Net View



Yield Learning – From FT to WS



Need data integration across:

- Fabs to SATs
- Different test equipments and vendors
- Test equipment to design database

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Need to improve efficiency in production:

- **Time to market**
- **Yield Improvement**
- **Test Cost Reduction**
- **Benchmarking**

Leads to:

- **Standardization**
- **Better integration across different equipments and vendors**