



ASML

Predictable Initial Product Performance

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EDM Event 2011 - Ontwikkeling, productie en integratie van elektronica

Agenda

- Introducing ASML – an enabler of the chip industry
- Chip industry drivers
- Strategy Consequences
- Initial Product performance

A decorative graphic consisting of numerous thin, light blue curved lines that sweep from the bottom left towards the top right, creating a sense of motion and depth. The lines are more densely packed on the right side, where they converge into a dark blue, curved shape that resembles a stylized arrow or a lens.

Introducing ASML, an enabler in the chip industry

Public



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Our strategy



To be a technology leader in lithographic systems and software for semiconductor manufacturing, thus enabling our customers to increase the functionality of microchips while reducing the cost and power consumption per function on a chip



ASML Headquarters in Veldhoven



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The chip industry drivers

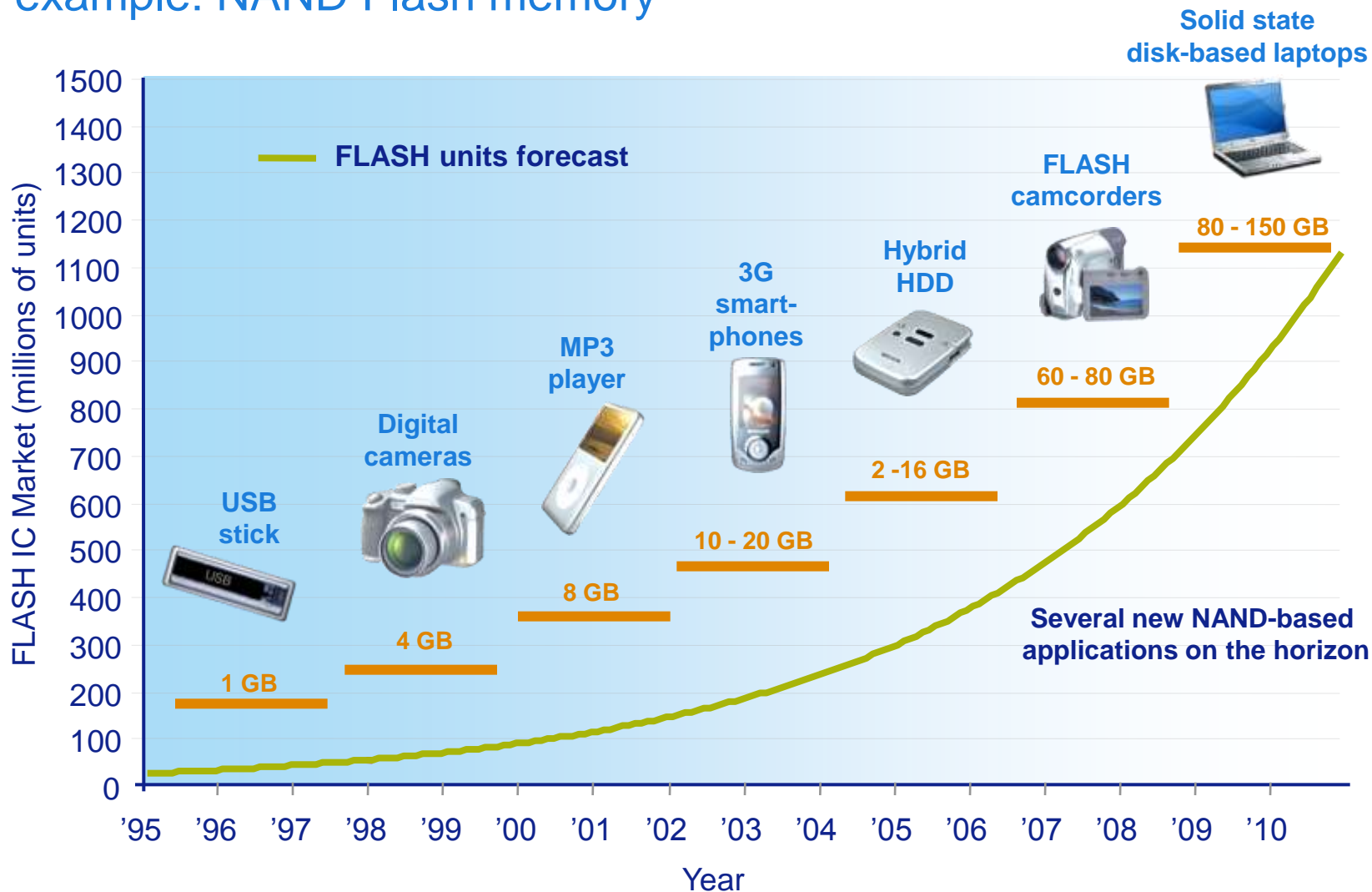
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Smaller and cheaper chips mean market growth

example: NAND Flash memory



Source: ASML MCC, WSTS, Gartner

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Strategy Consequences

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Systems that conquered the market

In 30 years: From 1,200 nm to less than 20 nm resolution

From <0.5M€ per system to >60M€

Wafer size
300mm → 400mm

Wafer size
150mm



1984:
PAS 2000

Resolution:
>1µm

overlay:
250 nm



1989:
PAS 5000

Resolution:
<500 nm

overlay:
100 nm

Wafer size
200mm



1990's:
PAS 5500

steppers/scanners

Resolution: 400 to 90 nm

overlay: 100 to 12 nm



2000's:
Twinscan

Resolution:
100 to 38 nm

overlay: 20 to 4 nm



2010's:
NXE EUV systems

Resolution:
32 to <20 nm
overlay: 2 nm



Time and space required to build a system



1984:
PAS 2000

Proto build



1989:
PAS 5000
12 weeks/12sqm



1990's:
PAS 5500
steppers/scanners
12 weeks/40sqm



2000's:
Twinscan
16 weeks/70sqm



2010's:
NXE EUV systems
35 weeks/ 250sqm



Complexity increase needed to accommodate performance



1984:
PAS 2000

120 PCBA's
DIL's



1989:
PAS 5000

250 PCBA's
DIL's



1990's:
PAS 5500
steppers/scanners

600 PCBA's
SMD



2000's:
Twinscan

800 PCBA's
Ball grids



2010's:
NXE EUV systems

1200 PCBA's
uBall grids



Strategy Consequences

- Limited number of machines
- Complexity increase per platform
- Increased Number of parts
- Machine Build time
- Machine Space requirements

Strategy Consequences

- Limited Number of machines (50/year)

- Total PCBA Serie size 100 – 300
 - Learning period is too long

- Complexity Increase

- 1200 PCBA's per machine (2010)
- 100 – 4000 parts/PCBA
 - Current Zero hour defect rate (high mix - low volume) <1%



Strategy Consequences

•Machine Build Time

- Machine build time disturbances (12 disturbances/machine)
 - Clean room space occupation
 - Interest loss over 35M €
- Spare parts
 - Customer machine down time



Initial Product Performance

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Required Initial Product Performance

- 1 Disturbance per machine build (Electronics)
 - 1200 PCBA's per machine & Limited series
 - PCBA Zero hour defect rate (high mix - low volume) <0.1%

Product performance

- Predictable performance of PCBA's
 - With 1 Disturbance during machine build
 - Cycle time reduction
 - Lower Total cost of PCBA (Test + product cost --)
 - Less clean room space
 - Less interest loss
 - Less handling defect products (DOA's)
 - Better discussion Test Cost versus Zero hour defects (0.1%)
 - From opportunistic testing -> Structured risk mitigation



Questions

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