ASML

Predictable Initial Product Performance

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Agenda

- Introducing ASML – a cornerstone of the chip industry
- Chip industry drivers
- Strategy Consequences
- Initial Product performance

Introducing ASML, a cornerstone of the chip industry

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Our strategy

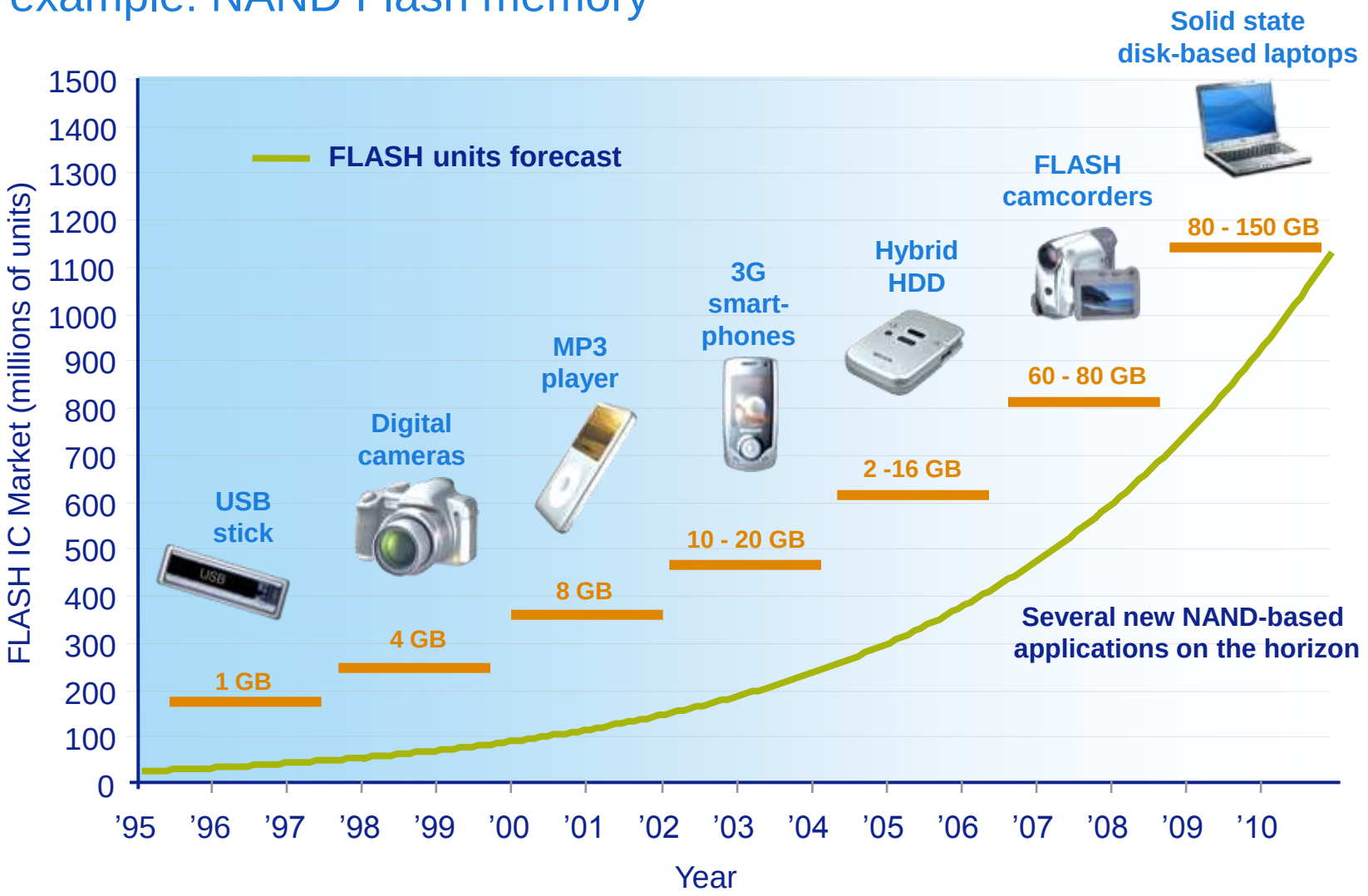
To be a technology leader in lithographic systems and software for semiconductor manufacturing,
thus enabling our customers to increase the functionality of microchips while reducing the cost and power consumption per function on a chip

ASML Headquarters in Veldhoven

The chip industry drivers

Smaller and cheaper chips mean market growth

example: NAND Flash memory



Source: ASML MCC, WSTS, Gartner

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Strategy Consequences

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€

1984:

PAS 2000

Resolution: >1μm

overlay: 250 nm

1989:

PAS 5000

Resolution: <500 nm

overlay: 100 nm

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

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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

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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

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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%

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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

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

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Questions

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