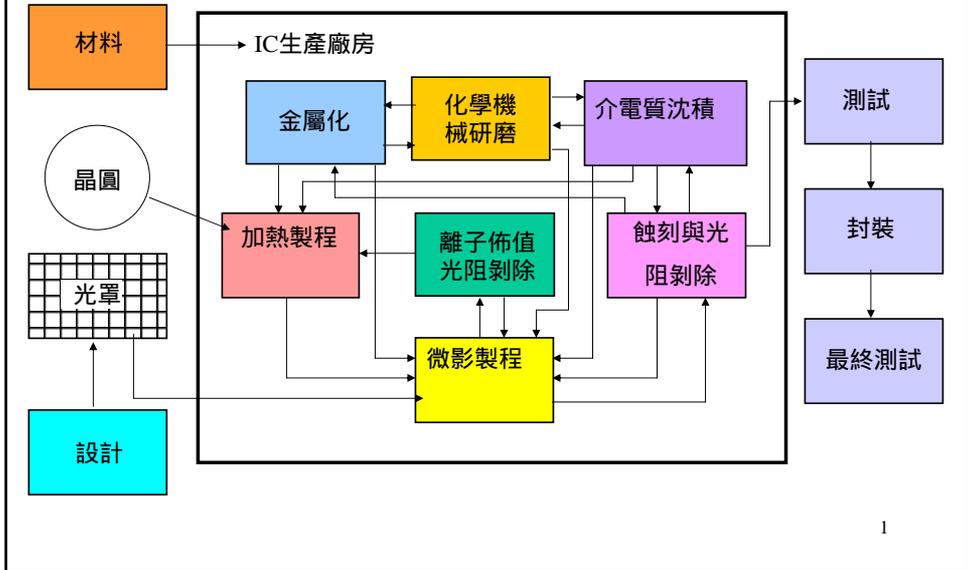
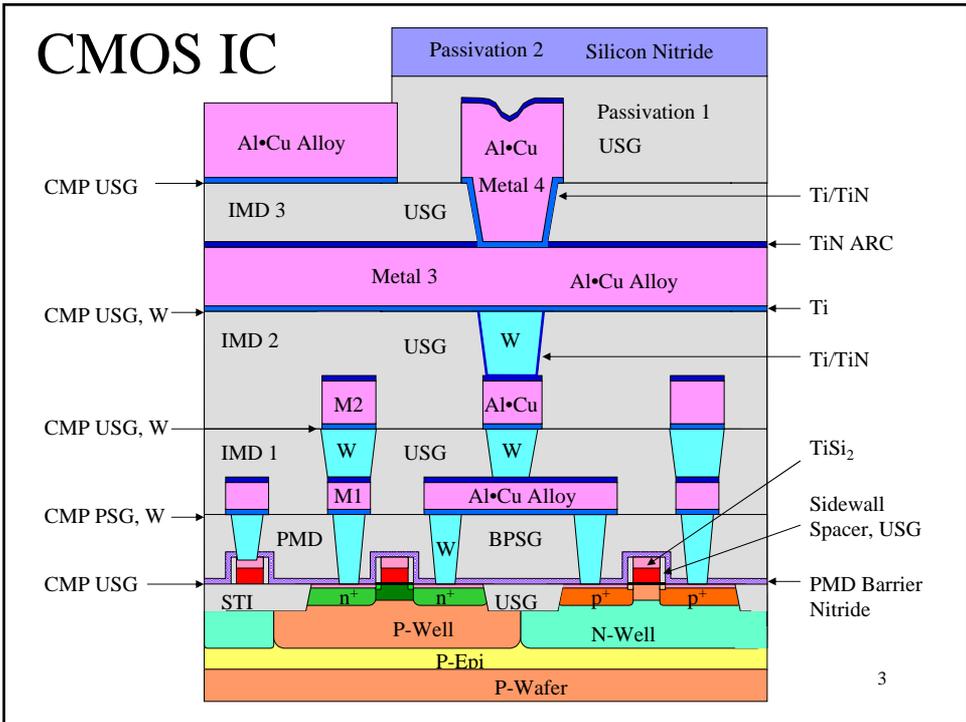


晶圓製程流程圖



Endura[®] PVD 系統





生產廠房如何賺錢

- 支出
 - 晶圓 (8") : ~\$150/晶圓*
 - 製程 : ~\$1200 (\$2/晶圓/步驟, 600個步驟)
 - 封裝 : ~\$5/晶片
- 銷售
 - ~200 晶片/晶圓
 - ~\$50/晶片 (低階的微處理器, 2000年)

*Cost of wafer, chips per wafer, and price of chip varies, numbers here are choosing randomly based on general information.

生產廠房如何賺錢（虧錢）

- 支出
- 100%良率: $150+1200+1000 = \$2350/\text{晶圓}$
 - 50%良率: $150+1200+500 = \$1850/\text{晶圓}$
 - 0%良率: $150+1200 = \$1350/\text{晶圓}$

- 銷售
- 100%良率: $200 \times 50 = \$10,000/\text{晶圓}$
 - 50%良率: $100 \times 50 = \$5,000/\text{晶圓}$
 - 0%良率: $0 \times 50 = \$0.00/\text{晶圓}$

- 邊際效益
- 100%良率: $10000 - 2350 = \$7650/\text{晶圓}$
 - 50%良率: $5000 - 1850 = \$3150/\text{晶圓}$
 - 0%良率: $0 - 1350 = -\$1350/\text{晶圓}$

5

問題

- 如果每一程序的良率皆為99%，試問經600個製程程序之整體良率為何？

答案:

- $0.99^{600} = 0.24\%$

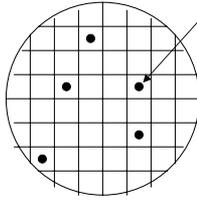
為了使一程序在經濟考量上為可實行的，試問每一步驟之良率需多高？

- $0.999^{600} = 54.8\%$
- $0.9999^{600} = 94.2\%$

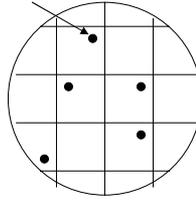
6

粒子污染

殺手缺陷



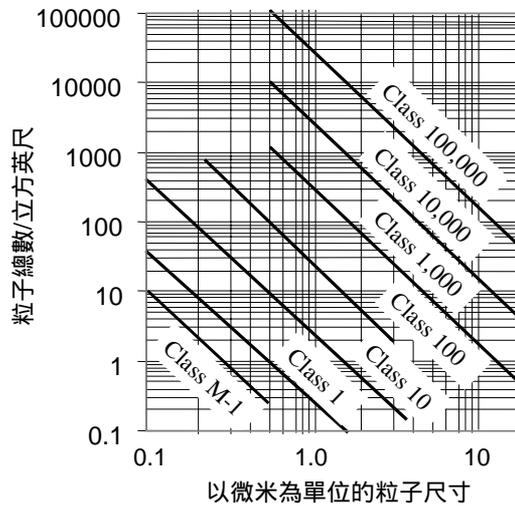
$$Y = 28/32 = 87.5\%$$



$$Y = 2/6 = 33.3\%$$

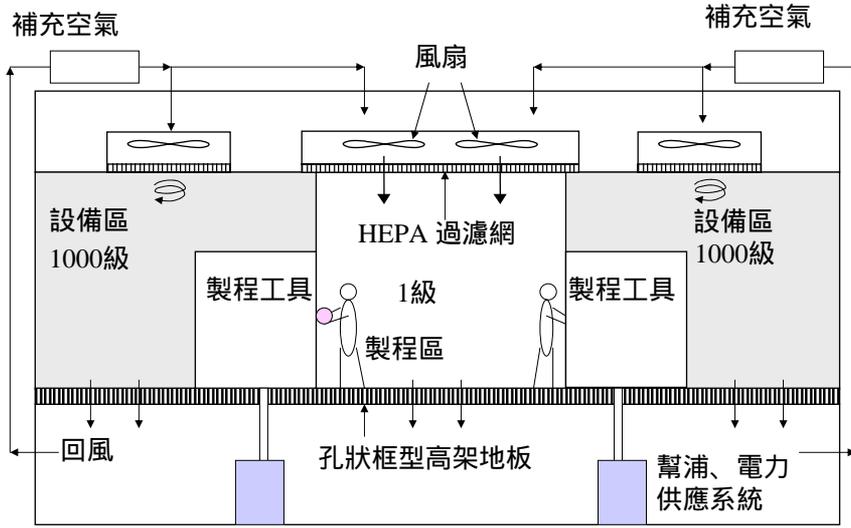
7

無塵室等級



8

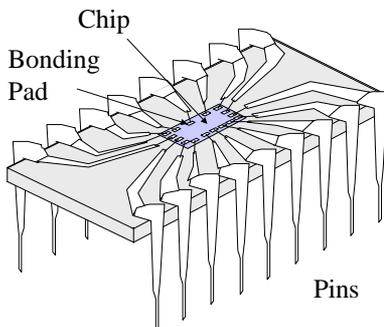
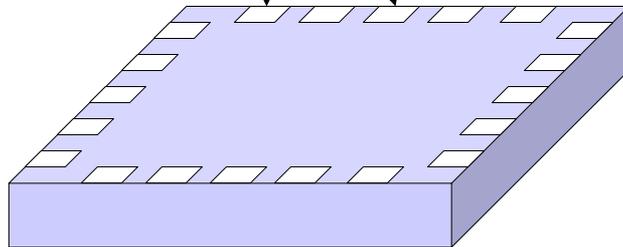
無塵室基本結構



等級在Class 100 以上(10,1...)為線性流;以下為混紊流turbulent flow

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接合墊片



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