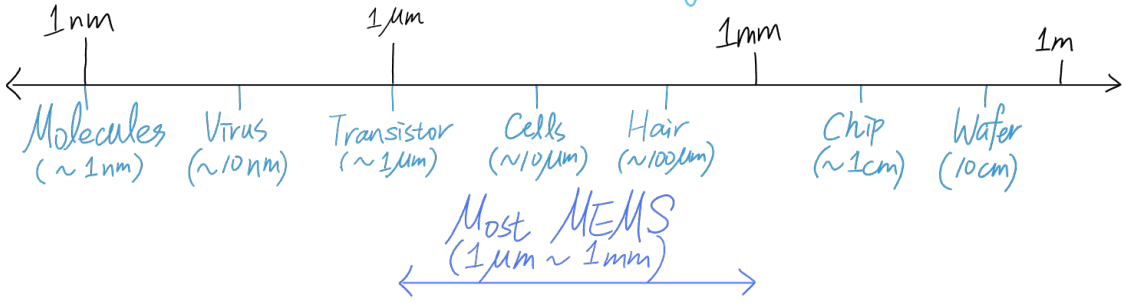
2025.09.30 <奈微機電系統技術及應用>
——國立中興大學機械系 戴慶良教授

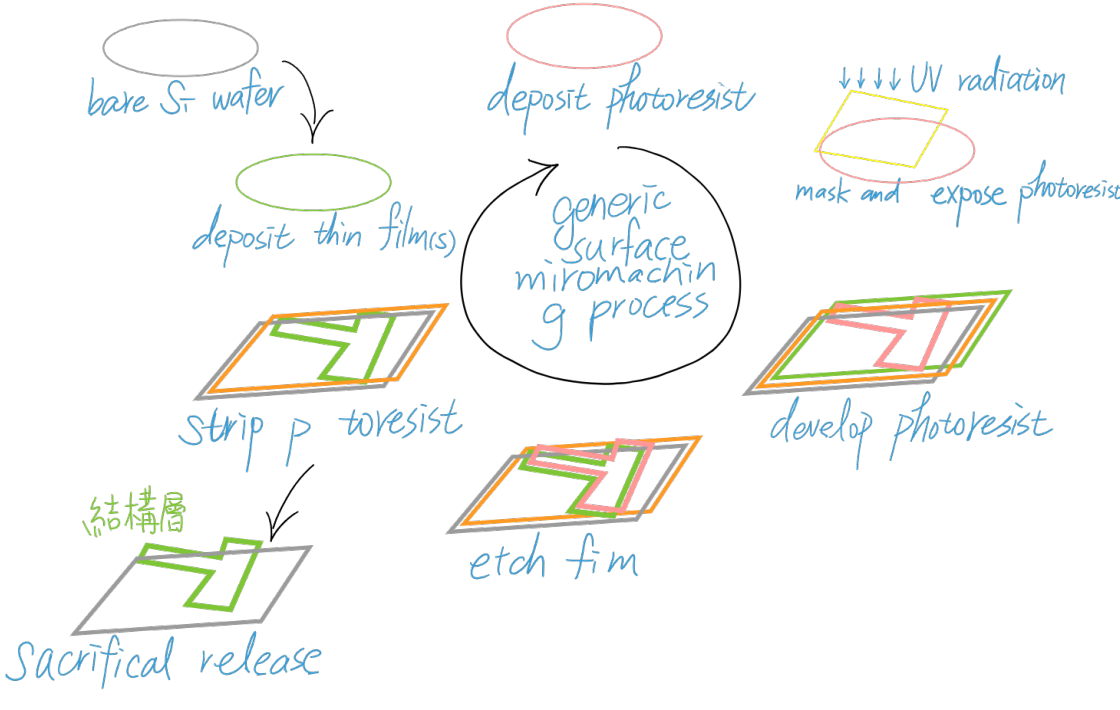
△Micro Electro Mechanical System



△MEMS三大製程加工方法

1. Surface Micromachining (表面微加工):

deposition, lithography, etching + sacrificial release

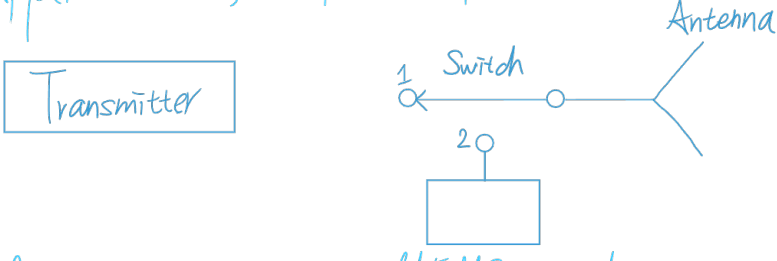


△ Micro mechanicd RF Switch (機械式射頻開關)
Micro tunable resonator (可調式共振器)

△

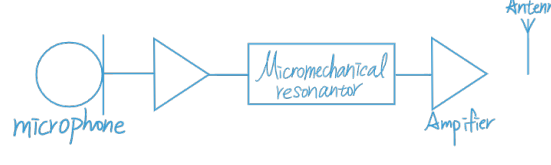
Switch Type	Insertion loss	Isolation	Power handling	Power consumption	Switching speed	Cost
PIN diodes	Good	Good	Good	Poor	Good	Good
GaAs FETs	Good	Good	Poor	Good	Excellent	Poor
MEMS Switches	Excellent (0.1~0.6dB)	Excellent (-40~-50dB)	Excellent	Excellent	Poor	Good

△ Applications of RF MEMS Switch



△ Electrostatic-type MEMS switches
- Metal contacting (金屬接觸形式)
- Capacitive coupling (電容耦合性)

△ Micromechanical resonator



1. High performance transducer
2. Cost low
3. Easy integrate with light, electricity, heat and magnet on a chip
4. Good stability at temperature and ageing

Application: wireless communication system