2025.09.30 〈奈微機電系統技術及應用〉 國文中國大學機械系 戴慶良教授 & Micro Electro Mechanical 1nm 1mm Molecules Virus Cells Chip Water Hair Transistor (~1,Um) (~10,Um) (~100,Um) (~1nm) (~10nm)  $(\sim 1 cm)$ (10cm) △UEUS三大製程加工方法 1. Surface Micromachining (表面微加工): deposition, lithography, etching + sacrificial release bare S- water deposit photoresist 1 1 1 W radiation mask and expose photoresist deposit thin film(s) process develop Photoresist toresist Strip P 結構層 etch fim Sacrifical release Made with Goodnotes

← Micro Mechanical RF Switch (機械式射頻開開) Micro tunable resonator (可調式其振器) Switch Type Isolation Power handling Insertion loss Cost Good PIN diodes Good Good Poor Good Good Good GaAs FETs Excellent Poor MEMS Excellent Excellent Good Excellent Excellent (0.1~0.6dB) (-40~-50dB) Switches X Applications of RF MEMS Switch
Antenna
Transmitter

Transmitter ransmitter △ 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 microphone]
2. Cost low 3. Easy integrate with light, electricity, heat and magnet on a chip 4. Good stability at temperature and ageing Applithation of Magnet Scommunication system