

2025.9.30 李微機電系統技術及應用

國立中興大學機械系

戴慶良教授

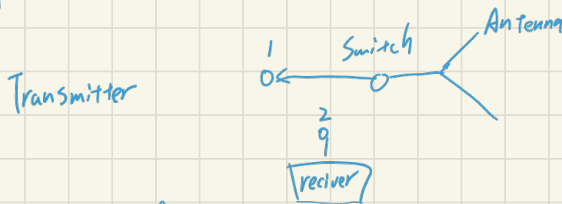
Micro Electro Mechanical System

1mm		1mm			1mm		1mm
Molecules	Virus	Transistor	Cells	Hair	chip	water	
(~1nm)	(~10nm)	(~1μm)	(~10μm)	(~10μm)	(~1mm)	(10cm)	

(Mechanical RF switch (機械式射頻開關)
Micro tunable resonator (可調式共振器))

Switch Type	Insertion loss	Isolation	Powerhandling	Power consumption	Switching speed	Cost
PIN diodes	Good	Good	Good	Poor	Good	Good
GaAs FETs	Good	Good	Good	Good	Excellent	Poor
MEMS switches	Excellent (~1~0.6dB)	Excellent (~40~50dB)	Excellent	Excellent	Poor	Good

Application of RF MEMS Switch Electrostatic type MEMS switches



(Metal contacting
Capacitive coupling)

Micromechanical resonator

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