Sensors For Wireless Applications

1. Sensing Environment

① Passive RFID Tags

→ Sensors powered off of carrier signal

→ sensors only powered when Tag being interrogated

→ sensing only during interrogation

→ Energy scavenging could be used to power sensors when Tag not being interrogated

② Active and Semipassive Tags

→ Battery can power sensors

→ How long will battery last?

→ Replaceable?

→ Rechargeable?

→ Supplementable by energy scavenging?

2. Application Characteristics

→ Is the measurand a one time event?

→ such as mechanical shock?

→ Is the measurand slowly varying?

→ air pressure

→ air temperature

→ RH

→ How often will the Tag be interrogated?

→ hourly?

→ daily?

→ monthly?

3. <u>No-Power Sensors</u>

a. <u>Introduction</u>

<u>definition</u> → sensors that detect a measurand and record the event, without applied power, for later interrogation

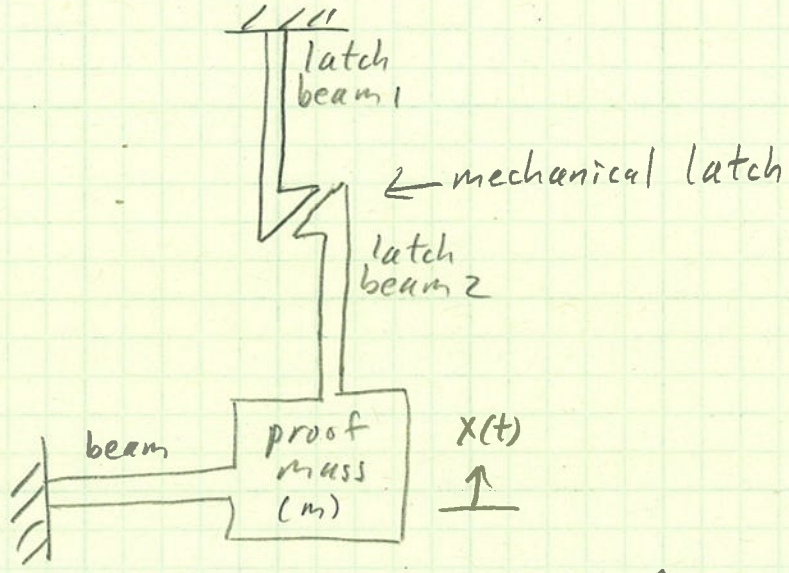
① Best for threshold detection

i.e. exceeding a level

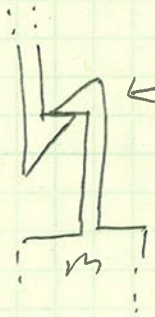
<u>ex</u>: a mechanical shock greater than 10G's

b. <u>Example sensors</u>

① <u>Mechanical shock / acceleration</u>



Above a preset acceleration level (a_{th}), m displaces up and trips the latch



the contact completes a circuit. i.e. a short indicates $a > a_{th}$ occurred