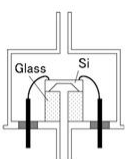
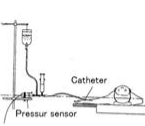


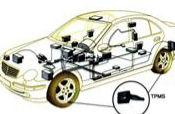
What is MEMS ?




Engine control



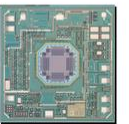
Blood pressure sensing



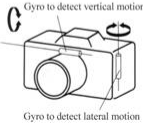
Tire pressure monitoring




Microphone



Accelerometer for airbag




Gyro for camera



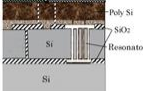
Accelerometer for user interface

Pressure sensor


Accelerometer & Gyro



Print head




Oscillator




MEMS switch

Communication



Display (DMD)



IR imager (Night vision)

Image (MEMS array)


2010 year

Structure + sensor + circuit + actuator

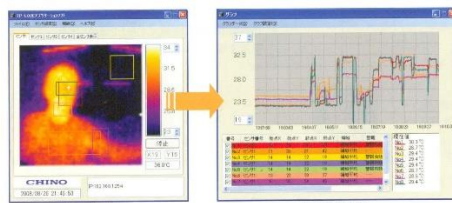
Advantages

- **Miniaturization** (high sensitivity, low power, good spatial resolution, etc.)
- **Integration** (low cost, array etc.)

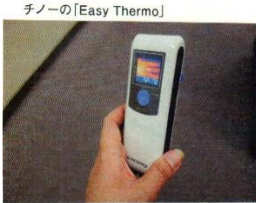
Trend of MEMS (Micro Electro Mechanical Systems) product




Compact thermal image sensor (Infrared imager) (Chino Ltd.)



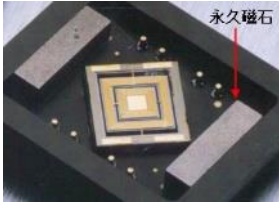
▲熱画像表示 ▲トレンドグラフ



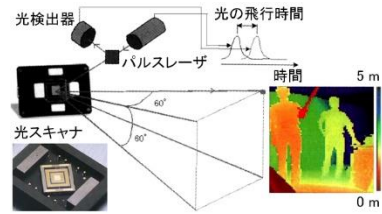
チノの「Easy Thermo」
約2000番子で価格は4万6000円(税別)!




Infrared imager for smartphone (FLIR (USA))



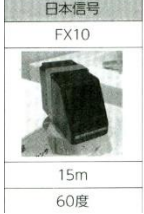
2 axes optical scanner (Nppon signal, Tohoku Univ.)



Range imager (Nippon signal)

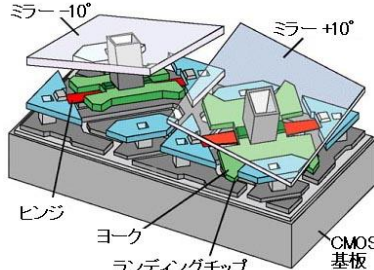


Application to platform door (JR Ebisu station)

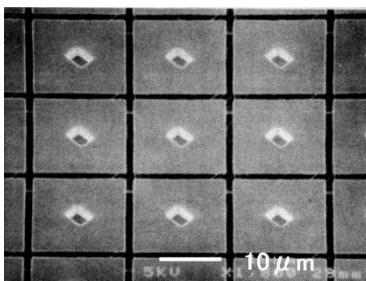


Application to LIDAR


(N.Asada et.al., IEEE Trans. on Magnetics, 30 (1994) 4647) (T. Ishida, Technical Report in Japan Signal, 33 (2009) 41)




ミラー -10° ミラー +10°
ヒンジ ヨーク ランディングチップ CMOS基板



10 μm



DLP® DIGITAL LIGHT PROCESSING
A Texas Instruments Technology



カラーフィルタ DLP®チップ 冷却 DLP®ボード
光源 光学系

Mirror array for video projector DMD (Digital Micro mirror Device) (Texas Instruments (USA))