Noise

HWQ - Selectivity

Aem process - Messersmith

how small is the signal can I detect?

accelerometer pressure
sound strain temp force
drop

capacitive accelerometer
piro resistive load cell
temp sensitive resistor & current source

Can I just keep increashing the gain? No

noise

signal -

noise

environmental noise

Bifields, E-fields @ 60Hz, 120Hz, ~4kHz

and others

use shielding, twisted pair, co-ax

accelerometer noise

hide in a noise isolation table

Fundamental

shot noise - particles over a potential barrier

\[ I_d \approx 2e I_d \Delta f \]

e.g. \( I_d = 3 \mu A \)

\[ \frac{I}{V_{th}} = \frac{1}{2(1.6 \times 10^{-19} C) 3 \times 10^{-16} A} \]

\[ = 10^{-12} A \frac{V}{\sqrt{Hz}} \]

\[ = \frac{3 \times 10^{-6}}{1.6 \times 10^{-19}} \times \frac{e^2}{\sqrt{Hz}} \]

\[ = 2 \times 10^{13} e^2 \]