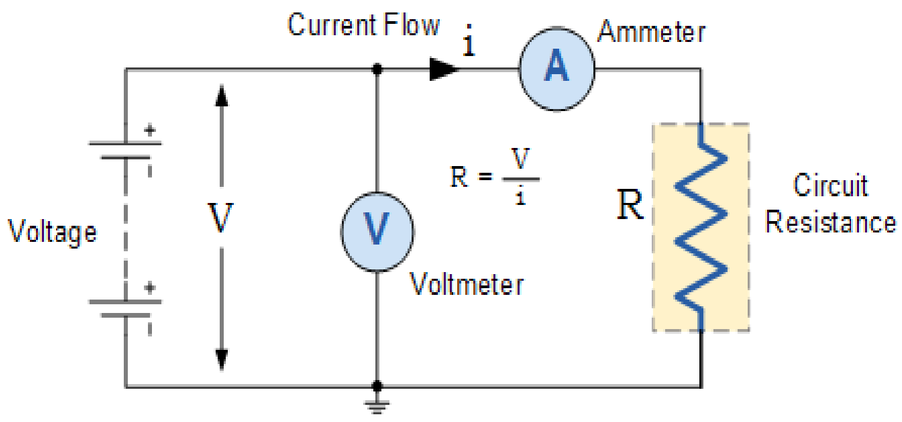
Nano Volt meter and Nano current source for IV curve, differential conductance and magneto-resistive measurements

PHYSICS department

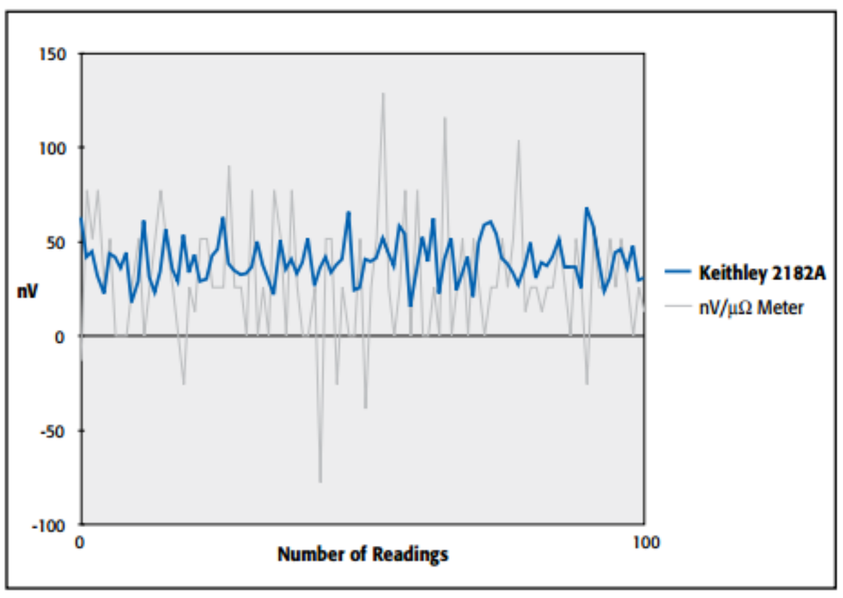
Introduction

The I-V Characteristic Curves, which is short for Current-Voltage Characteristic Curves or simply I-V curves of an electrical device or component, are a set of graphical curves which are used to define its operation within an electrical circuit. As its name suggests, I-V characteristic curves show the relationship between the current flowing through an electronic device and the applied voltage across its terminals.



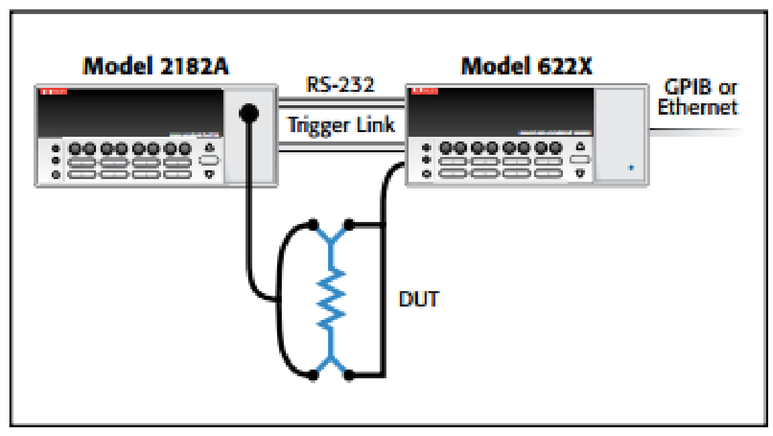
Nano voltmeter (Keithley 2182A)

The two-channel Model 2182A Nanovoltmeter is optimized for making stable, low noise voltage measurements and for characterizing low resistance materials and devices reliably. It provides higher measurement speed and significantly better noise performance than alternative low voltage measurement solutions. It offers a simplified delta mode for making resistance measurements in combination with a reversing current source, such as the Model 6220 or 6221.



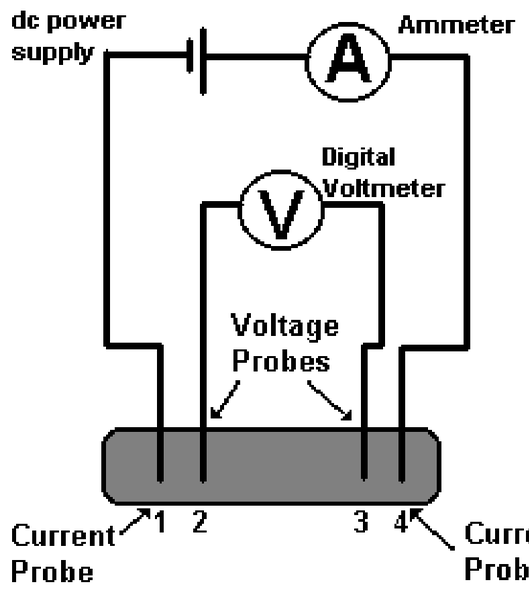
Current source (Keithley 6221)

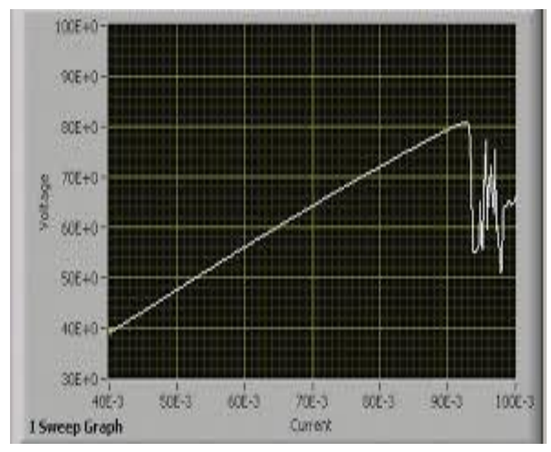
The Model 6220 DC Current Source and Model 6221 AC and DC Current Source combine ease of use with exceptionally low current noise. Low current sourcing is critical to applications in test environments ranging from R&D to production, especially in the semiconductor, nanotechnology, and superconductor industries.



Approaches can be use

- Two probe
- Four probe





Basic operation:

- IV measurement

Advance operation:

- Differential conductance
- Magneto-resistive measurements