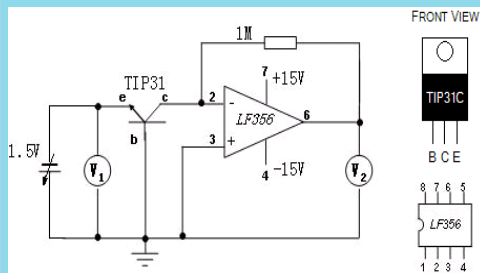
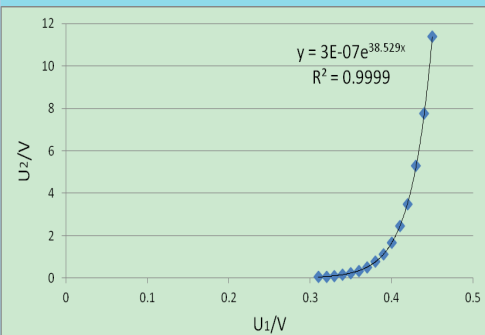


LEEI-50 PN Junction Characteristics Measurement Apparatus

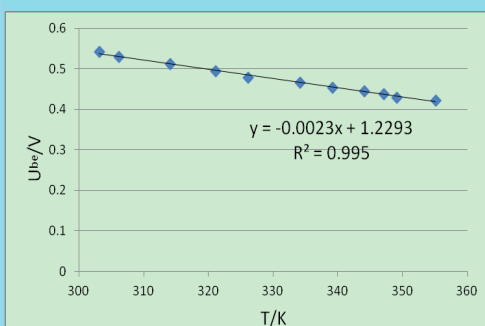
- Multiple parameters measurement
- Easy to use
- Affordable



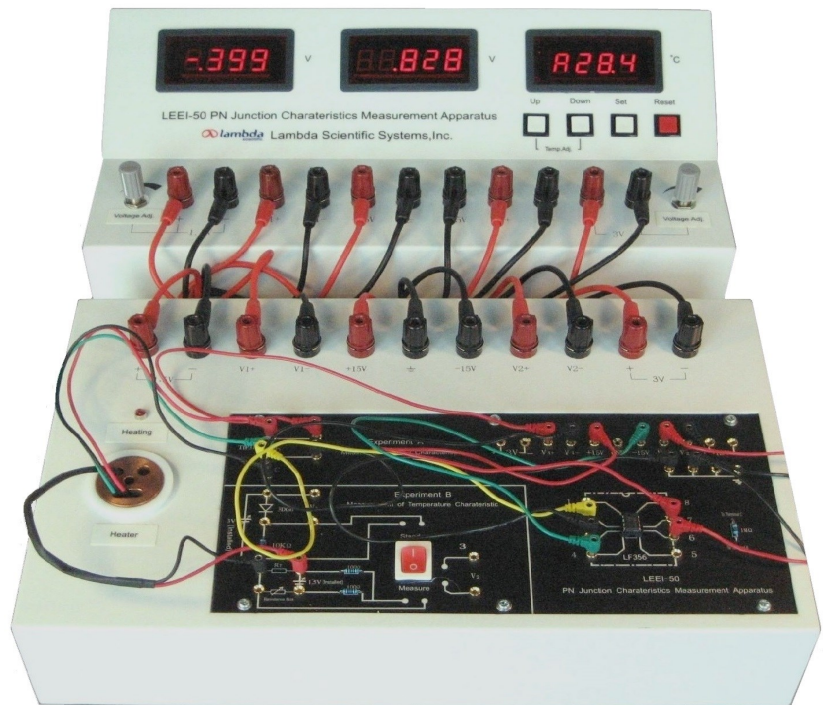
Circuit diagram



Diffusion current vs junction voltage



Junction voltage vs temperature



The physical properties of a PN junction are important parameters in general physics, semiconductor physics and electronics. The Boltzmann constant is one of the important fundamental constants in physics. This experimental apparatus can be used to measure the physical properties of a PN junction and the Boltzmann constant. It can also be used as a learning tool for measuring weak current. The instrument includes thermostats controller and platinum resistance thermometric bridge, and can hence measure the relationship between PN junction voltage and thermodynamic temperature, calculate the sensitivity of a temperature sensor, and obtain the prohibited bandwidth of a silicon material at 0 K approximately. This instrument is designed for teaching general physics at colleges and universities.

Experimental Contents

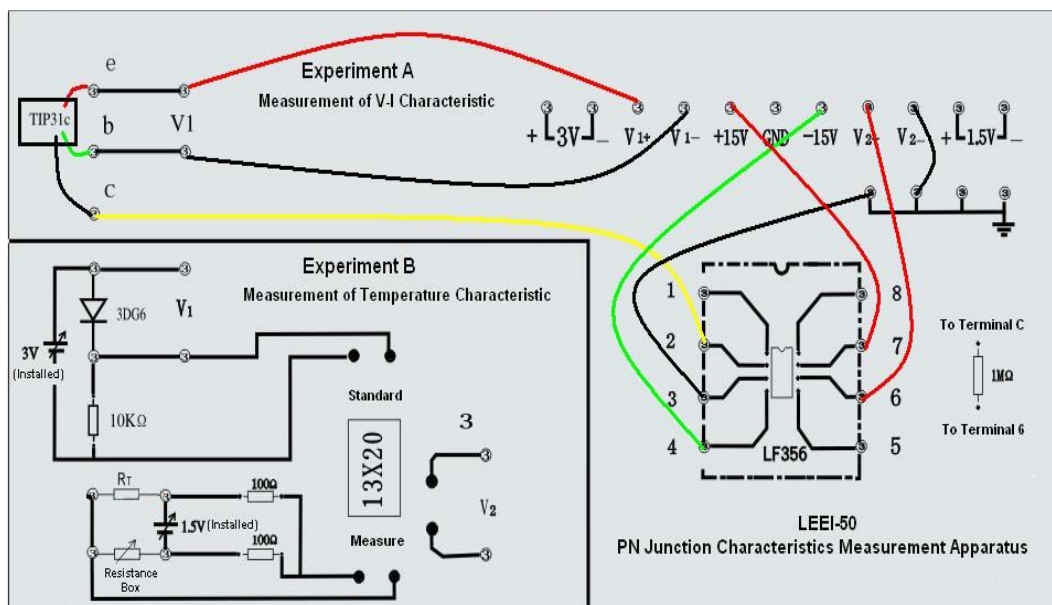
1. Measure PN junction diffusion current versus junction voltage, and acquire Boltzmann constant
2. Construct a current-voltage converter using operational amplifiers for measuring weak current
3. Measure junction voltage and sensitivity of junction voltage with temperature
4. Obtain prohibited bandwidth of silicon material at 0 K approximately
5. Measure temperature and electrical resistance using platinum resistance and DC bridge method

Specifications

DC power supply	2 sets, 0 ~ 15 V and 0 ~ 1.5 V, adjustable
Digital voltmeter	2 sets, 3-1/2 digit, range: 0~2V; 4-1/2 digit, range: 0 ~ 20 V
Temperature controller	range: room temperature to 80 °C, resolution: 0.1 °C

Part List

Main unit	2
TIP31 transistor	1
Thermostat	1
C9013 transistor	1
LF356 Op-Amp	2
Jumper wire	25
Signal cable	1
Instruction manual	1



Panel circuit connection for measuring diffusion current vs junction voltage