

Characteristic curves of a solar cell 4.1.09-01



What you can learn about ...

- Semiconductor
- p-n junction
- Energy-band diagram
- Fermi characteristic energy level
- Diffusion potential
- Internal resistance
- Efficiency
- Photo-conductive effect
- Acceptors
- Donors
- Valence band
- Conduction band

Principle:

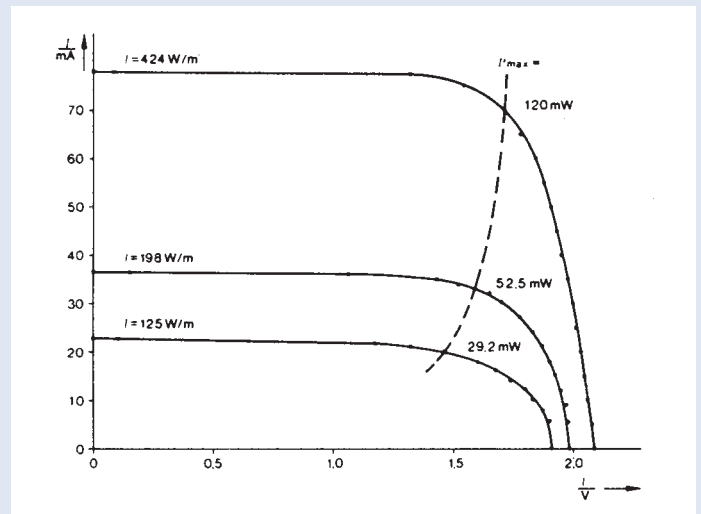
The current-voltage characteristics of a solar cell are measured at different light intensities, the distance between the light source and the solar cell being varied.

The dependence of no-load voltage and short-circuit current on temperature is determined.

What you need:

Solar battery, 4 cells, 2.5 x 5 cm	06752.04	1
Thermopile, Moll type	08479.00	1
Universal measuring amplifier	13626.93	1
Rheostats, 330 Ω, 1.0 A	06116.02	1
Ceramic lamp socket E27 with reflector, switch, safety plug	06751.01	1
Filament lamp with reflector, 230 V/120 W	06759.93	1
Hot/cold air blower, 1700 W	04030.93	1
Meter Scale, $l = 1000 \times 27$ mm	03001.00	1
Tripod base -PASS-	02002.55	2
Barrel base -PASS-	02006.55	2
Support rod -PASS-, square, $l = 250$ mm	02025.55	1
Right angle clamp -PASS-	02040.55	2
Plate holder, opening width 0...10 mm	02062.00	1
Universal clamp	37718.00	1
G-clamp	02014.00	2
Glass pane, 150 x 100 x 4 mm, 2 off	35010.10	1
Digital multimeter 2010	07128.00	2
Laboratory thermometers, -10...+100°C	38056.00	1
Connecting cable, 4 mm plug, 32 A, red, $l = 50$ cm	07361.01	3
Connecting cable, 4 mm plug, 32 A, blue, $l = 50$ cm	07361.04	2

Complete Equipment Set, Manual on CD-ROM included  
 Characteristic curves of a solar cell P2410901



Current-voltage characteristic at different light intensities  $J$ .

Tasks:

1. To determine the light intensity with the thermopile at various distances from the light source.
2. To measure the short-circuit current and no-load voltage at various distances from the light source.
3. To estimate the dependence of no-load voltage, and short-circuit current on temperature.
4. To plot the current-voltage characteristic at different light intensities.
5. To plot the current-voltage characteristic under different operating conditions: cooling the equipment with a blower, no cooling, shining the light through a glass plate.
6. To determine the characteristic curve when illuminating by sunlight.