To validate the theory, we made some tests with the same type of components than in our achitecture.

To do so, we used:

- CIGS flexible solar cells

- STEVAL ISV006V2 board with a MPPT SPV 1040 and potentiometers

- 3.3V Step-Up/Step-down Voltage Regulator

- 5V Step-Up Voltage Regulator

- Li-Po Battery 3.7V

## **Solar cells efficiency**

First of all, we have to check the efficiency of the CIGS solar cells. To do so, we used a luxmeter, a multimeter and a load.

CIGS cell is 24 cm by 7.3 cm 

The solar power is of 1W/m² according to the lux meter.

The voltage at the output of the solar cell is of 10V for a 0.2A current.Then, the cells have a output Power of



We can deduce the efficiency of the cell

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## **Voltage regulators test**

We check the voltage regulation through Voltage 3.3V regulator and Voltage 5V regulator using both battery or solar cells. The output voltage of regulators can be regulated only if the current through it is strong enough to manage the voltage. Therefore, for a bad sunlight (such as under a 1W light), the regulator cannot works. At the opposite, it works under the real Sunlight, outside during the day. Therefore the regulators should also work in space. You can find the description of the test in the document at the end of the page: Model EPS.

## **Charge a Battery**

## **Power an Arduino Board using PV cell, MPPT board, and 5V Regulators**

## **Download Model EPS file**