Open loop test

Graph current in the inductor and output voltage to validate figure 3.2.

Graph current in the inductor and input voltage to check the ripple.

\subsection{Thermal test}

\subsection{MPPT}

Set irradiance 1000 $W /m2$ and T= 25 $\decC$. This is:

Isc = 8.67 A (in the simulator in the lab set this current to the max which is 8.6 A), Voc=45 V, Impp=8.14 A and Vmpp=36.9 V.

For load resistance R=3 $\Omega$ (buck) and R=27 $\Omega$ (boost), plot the next graphs in the oscilloscope:

Input voltage vs Input current

Input power. Pmpp=300.4W

XY graph of Vin and Iin. I-V curve

Input voltage vs Output voltage

Duty cycles for buck and boost mode using the Analog output from RT-box.

Optional plot input power vs output power to show the efficiency of the converter.

Set the PV simulator to detect a step change in irradiance keeping T=25 $\decC$. Save 2 lists of data, one for 1000 $W /m2$ of irradiance (same values as before) and the other for 800 $W /m2$. This is:

Isc = 6.94 A, Voc= 44.52 V, Impp= 6.49 A and Vmpp= 36.9 V.

For load resistance R=3 $\Omega$ (buck) and R=27 $\Omega$ (boost), plot the next graphs in the oscilloscope:

Input voltage vs Input current

Input power. Pmpp = 300.4 to Pmpp = 240W

XY graph of Vin and Iin. I-V curve

Optional plot input power vs output power to show the efficiency of the converter.

Set the PV simulator to detect a step change in temperature keeping irradiance to 1000 $W /m2$.

Save 2 lists of data, one for T=25$\decC$ (same values as before) and the other for T=20$\decC$. This is:\todo{In simulations the step change in temperature is 25- 35$\decC$, however, for 35$\decC$ the short circuit current is 9.5 which is higher than the max. allowed for the PV simulator(8.6A) so a change to a higher temperature would not be possible in the lab.}

Isc = 8.2 A, Voc= 47.1 V \todo{We must check if the PV simulator can work with these values}, Impp= 7.75 A and Vmpp= 39.1 V.

For load resistance R=3 $\Omega$ (buck) and R=27 $\Omega$ (boost), plot the next graphs in the oscilloscope:\todo{In case we can simulate this change, modify the graphs obtained in simulation for 25-35 $\decC$}

Input voltage vs Input current

Input power. Pmpp=300.4 to Pmpp=303.2W

XY graph of Vin and Iin. I-V curve

Optional plot input power vs output power to show the efficiency of the converter.