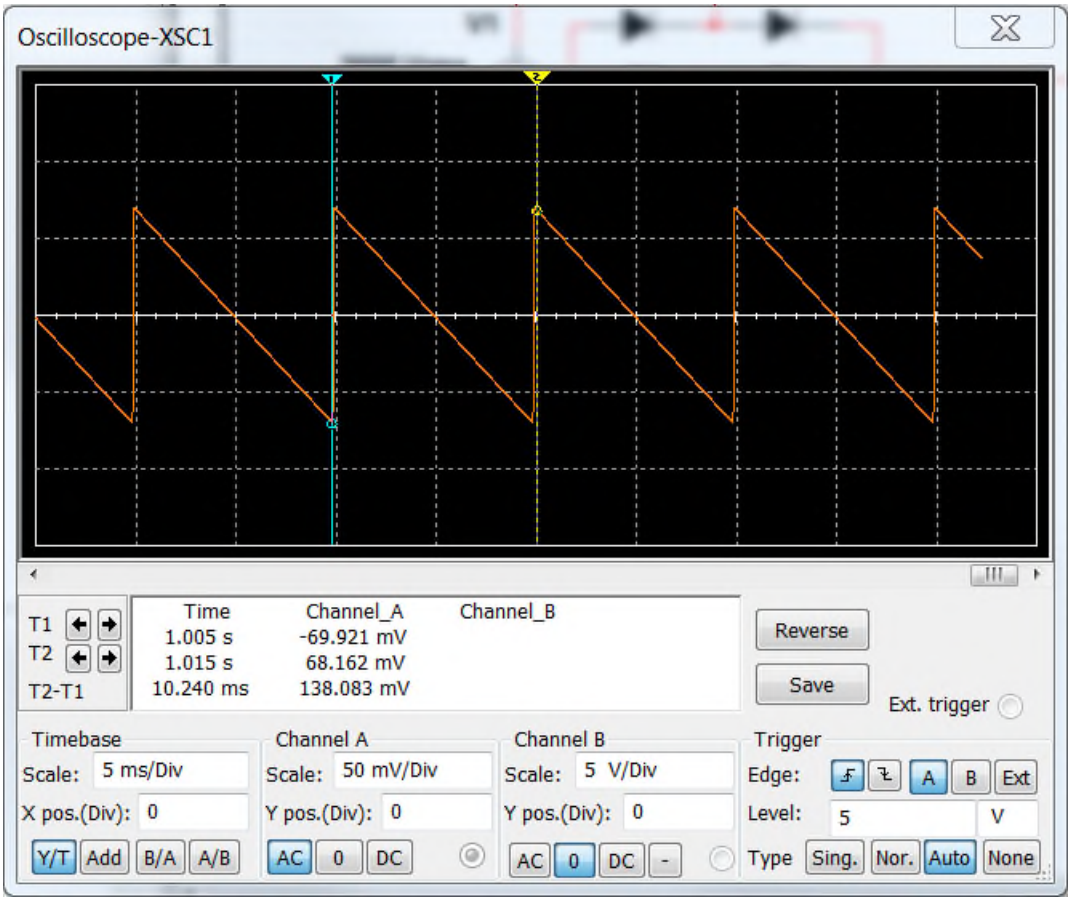
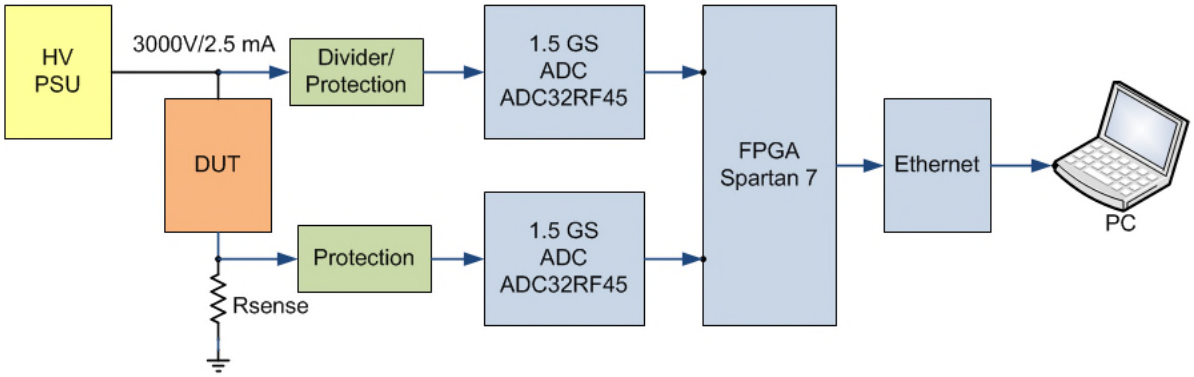
Well, m (~~micro~~, mille, 1e-3) and uF (~~mille~~, micro, 1e-6) is a factor 1000 in difference and change the situation. A 7.5 KV, 1 mF capacitator is not a so common. Anyhow it changes the ripple output from the circuit as below:



In this case we have a ripple of about 138 mV with a constant load of 1 Mohm. The output will be about 2827 Volt and the load current 2.827 mA.

It could be wise to protect the diodes by the resistor Rf indicated in the circuit diagram. The value depends on the maximum current that the diodes can handle.

If I understand it correctly you want to dynamically measure energy level of the small pulses that your device consumes I real time. As I understand it the pulses are in the order of about 300 nS. To do that with some accuracy you need to sample the voltage and current at a high rate and compute the integral over time. A circuit as below can be one solution. The sample rate of the ADC32R45 is 1.5 GSPS so you will get about 300 / (1/1.5) = 450 samples during the pulse. The ADC32R45 has two channels and 14 bit resolution. That should give you a pretty good estimate of the energy consumption of the device. Eventually you can find an evaluation board with the ADC/FPGA solution.



Eventually the Red Pitaya SIGNALlab 250-12 could be a solution. However this is rather slow and has only 250Msps. More information can be found here:

https://redpitaya.com/signallab-250-12/

/Bo, SM6FIE