

Autorange Capacitance Meter

ajay_bhargav, Wed Oct 21 2009, 06:21 pm

You might have seen small voltmeter project which i had already posted in download section, Now you can add few more features to your voltmeter to name it to a Volt and Capacitance meter.

I have found this great project which can measure capacitance of an unknown capacitor ranging from 5pF to 2600uF. This project is made on PIC microcontroller and the idea can be ported to any controller you know or like to work on.

The working principal of this project is based on charging and discharging of an RC circuit. As we know that discharging of capacitor is measured with time constant Tau, which is

$\tau = RC$. and voltage across capacitor at any time 't' during discharge can be calculated as,

$$V_{cap} = E[1 - e^{-(t/RC)}]$$

Substituting t with $\tau = RC$,

$V_{cap} = 0.632E$ or 63.2 % of the charging voltage, for 5V it will be about 3.16V, which is kept as reference voltage for calculating the unknown capacitor.

You can get more information on this project along with circuit and code over here

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