Electronics
Capacitors

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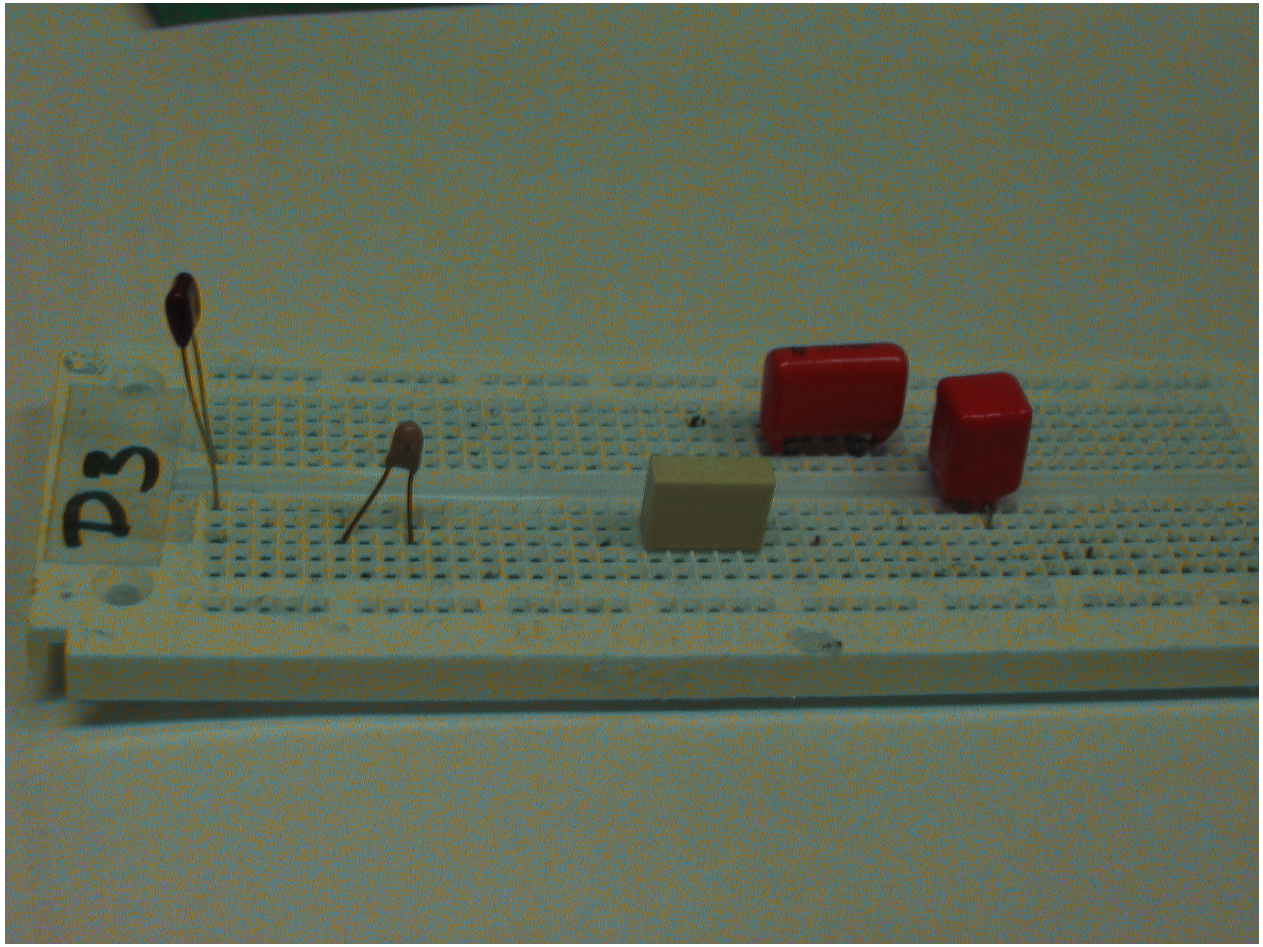
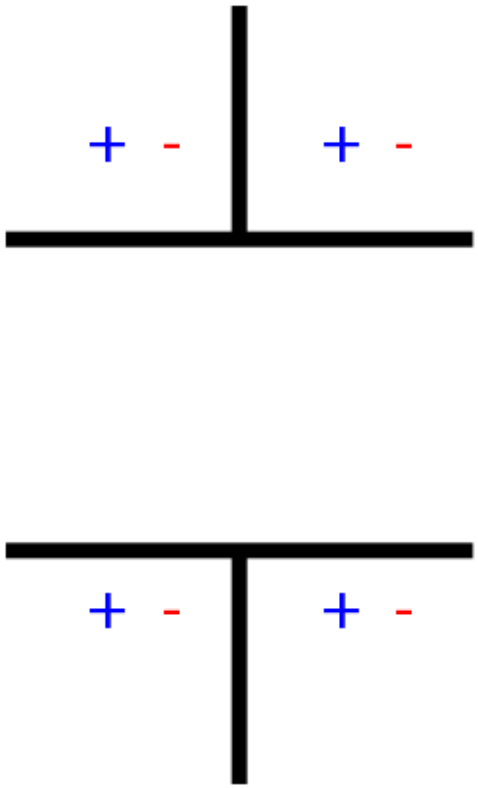
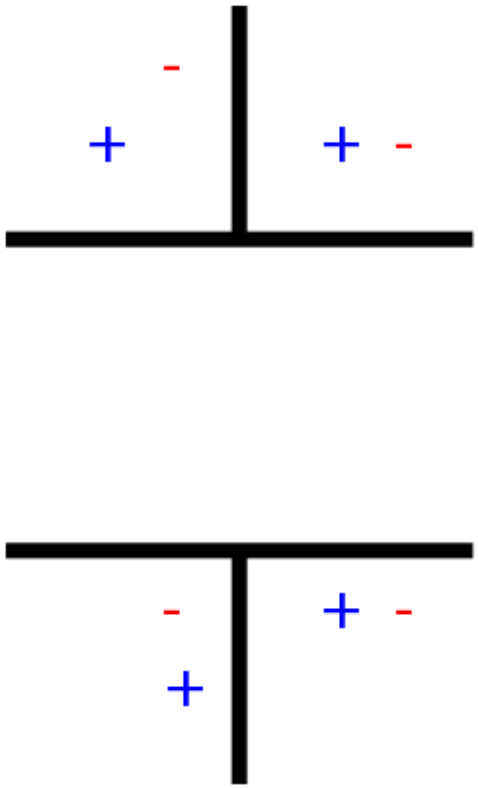
  usually microfarad (μF) or picofarad (pF) values are used



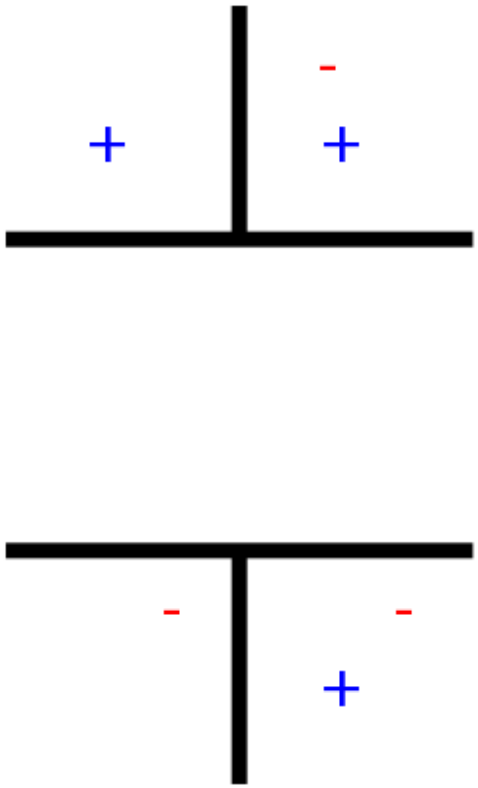
- Various capacitors



Capacitor uncharged



Capacitor charging; charge on opposite plates is equal and opposite.



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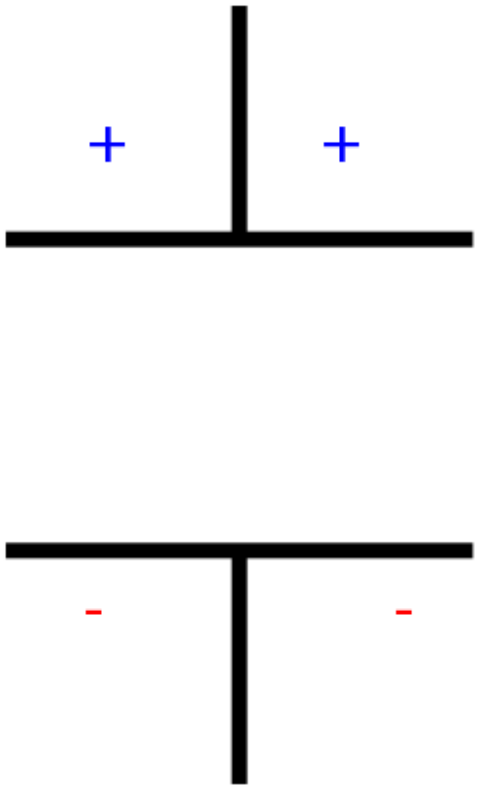

Capacitor charged; no more change

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  as charge is stored, voltage increases and current decreases until the voltage equals the applied voltage, when current becomes zero

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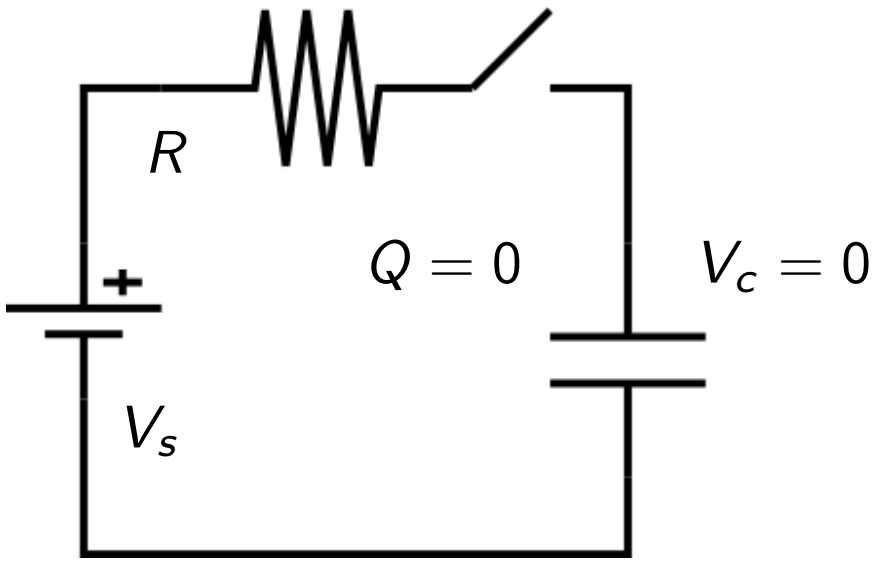
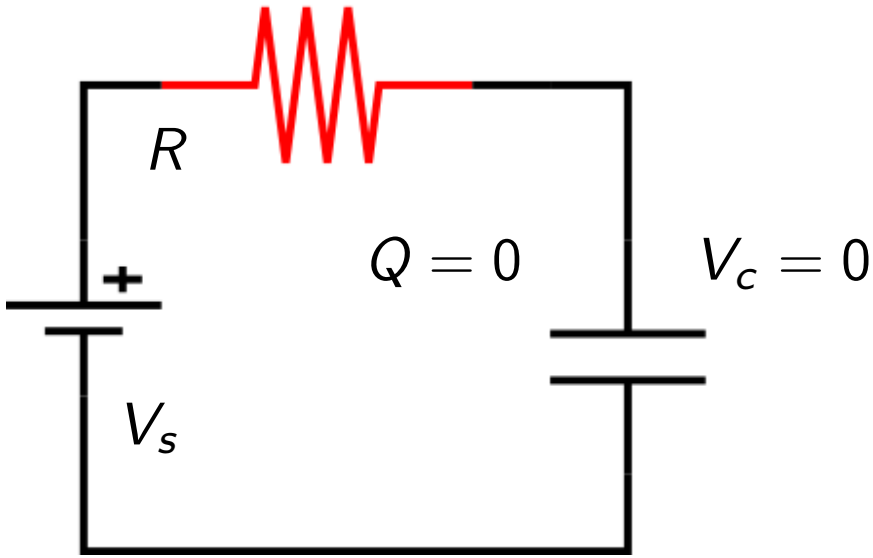
  Place $1k\Omega \rightarrow 10k\Omega$ resistor across the terminals to discharge.
- High voltage capacitors should be stored with terminals shorted.

$$I = 0$$



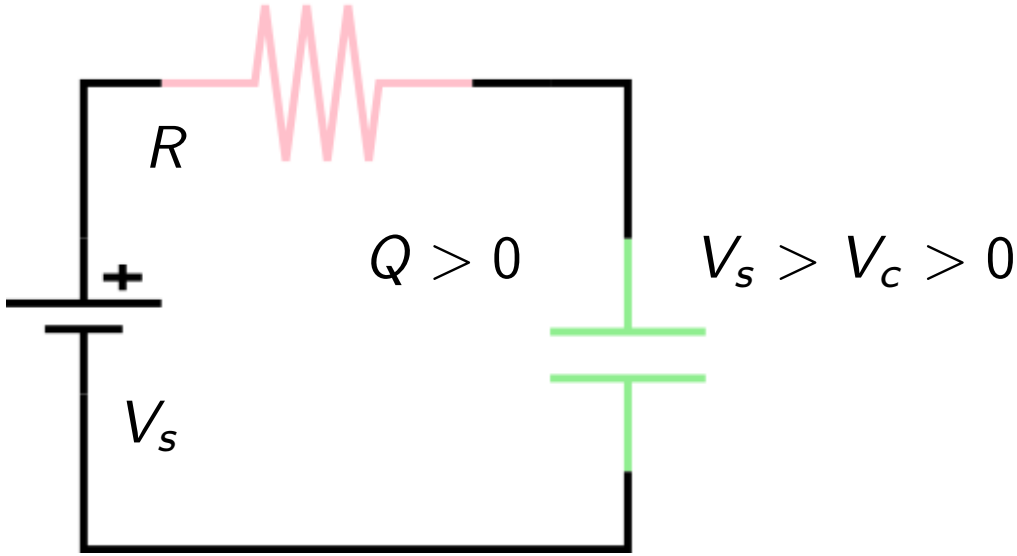
$t = 0$, switch **open**

$$I = V_s/R$$



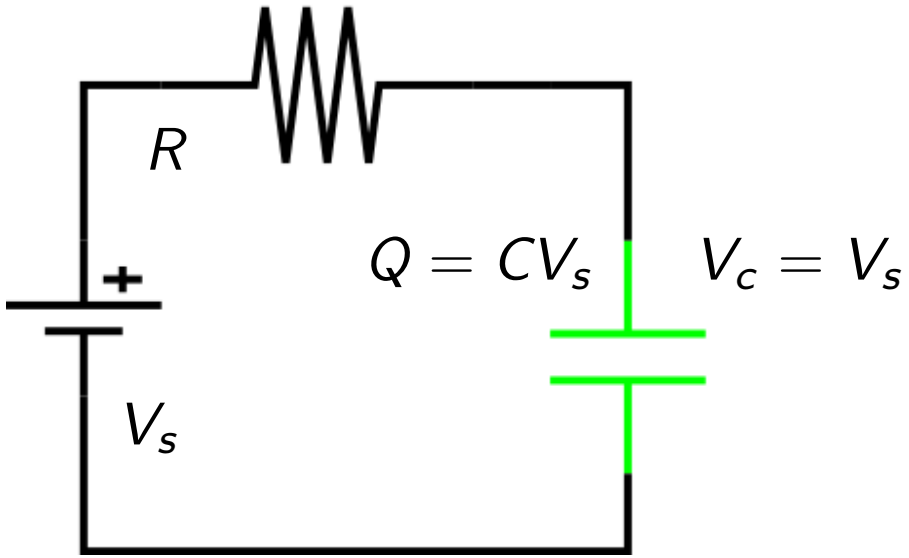
$t = 0$, switch closed

$$I < V_s/R$$



$$t \approx RC$$

$$I = 0$$



$t >> RC$

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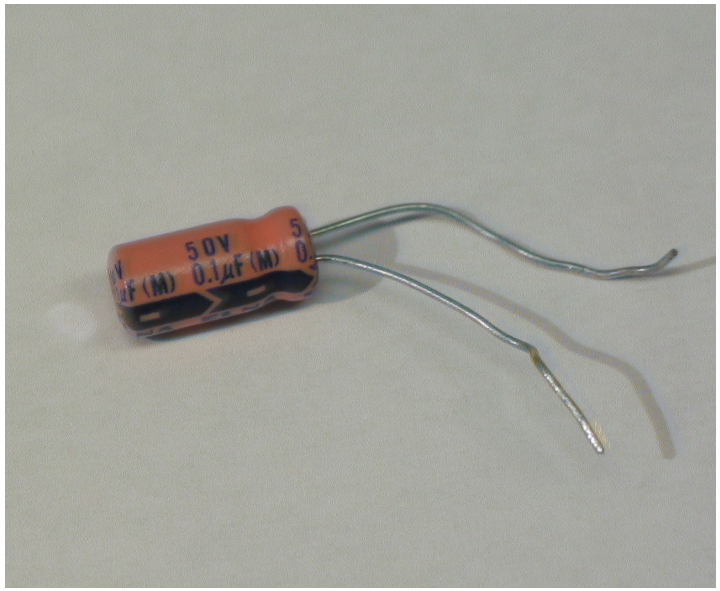
  (indicated by a "+" sign at one end.)
- **Big capacitors ($\gtrsim 1\mu F$) are usually electrolytic.**

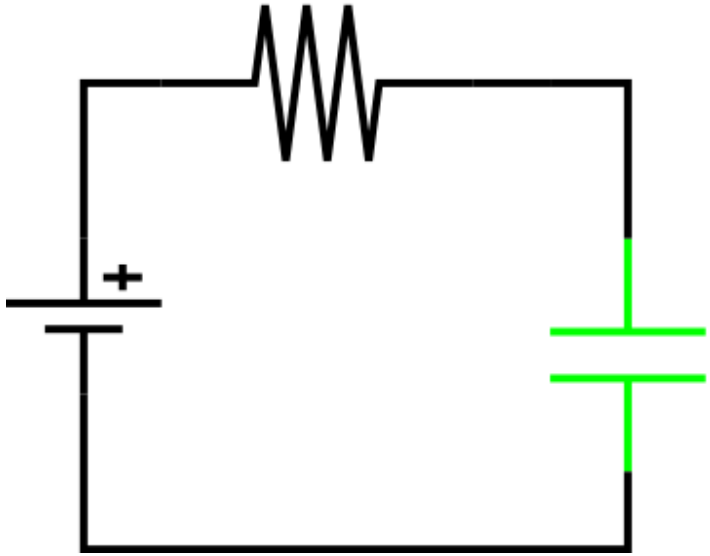


- Small electrolytic capacitor

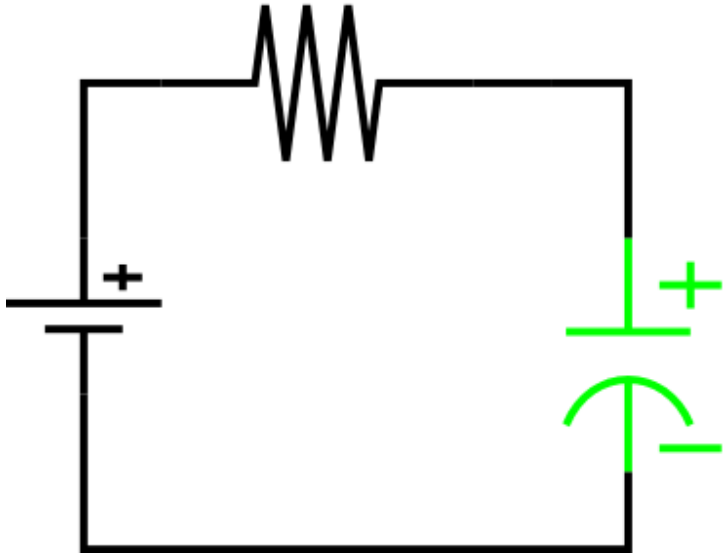
- Big electrolytic capacitor

- Big electrolytic capacitor (top view)

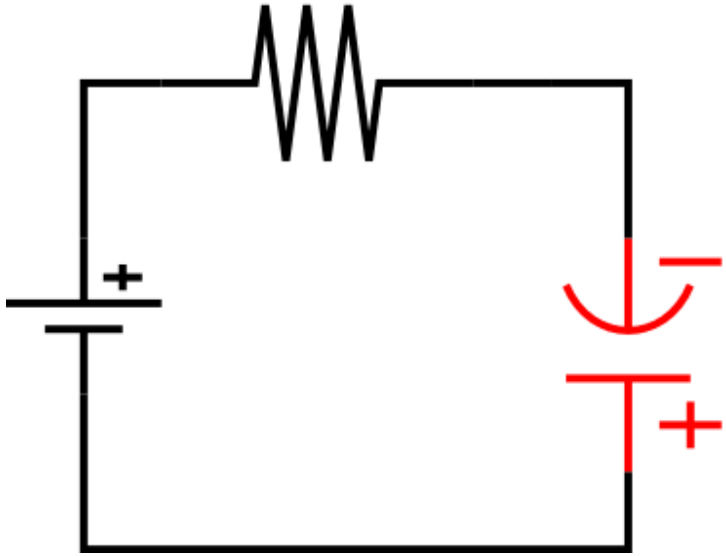
- Big electrolytic capacitor label



Non-polarized capacitor



Polarized capacitor connected the right way



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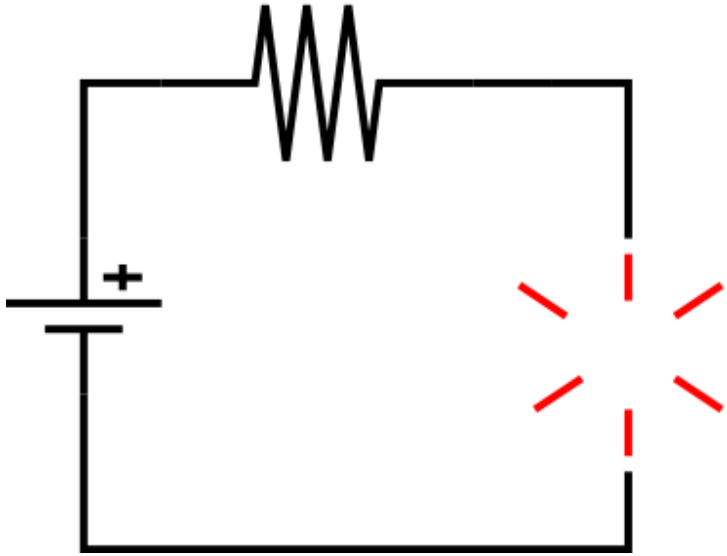

Don't do this!!!

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Unfortunately, capacitor labels are much less standardized than resistor labels.

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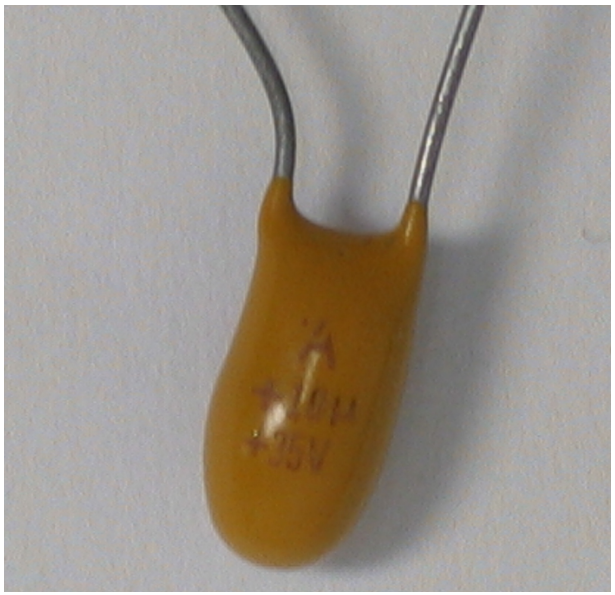

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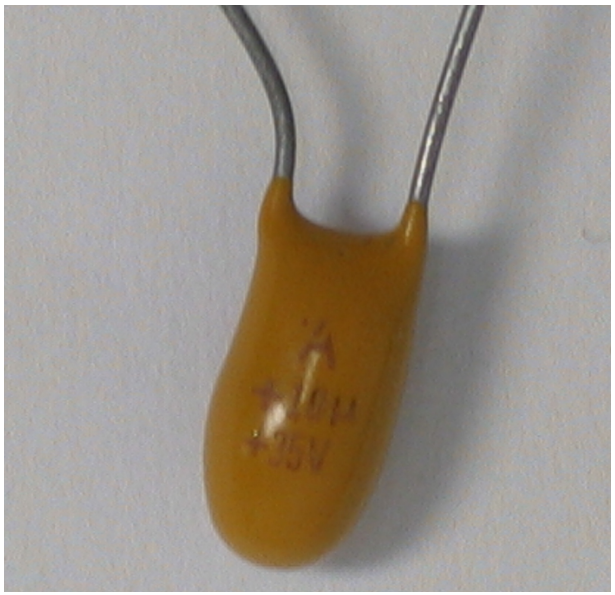
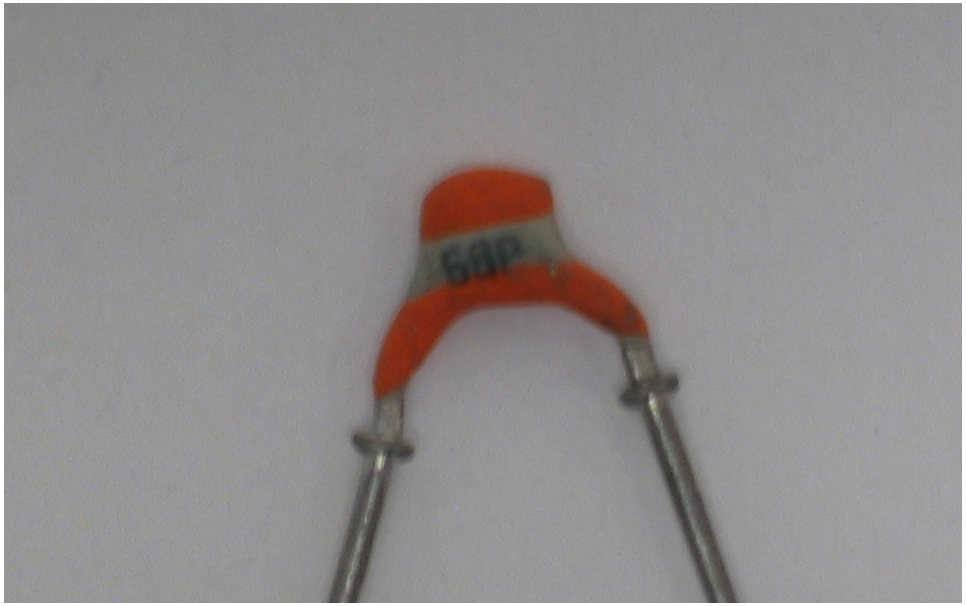
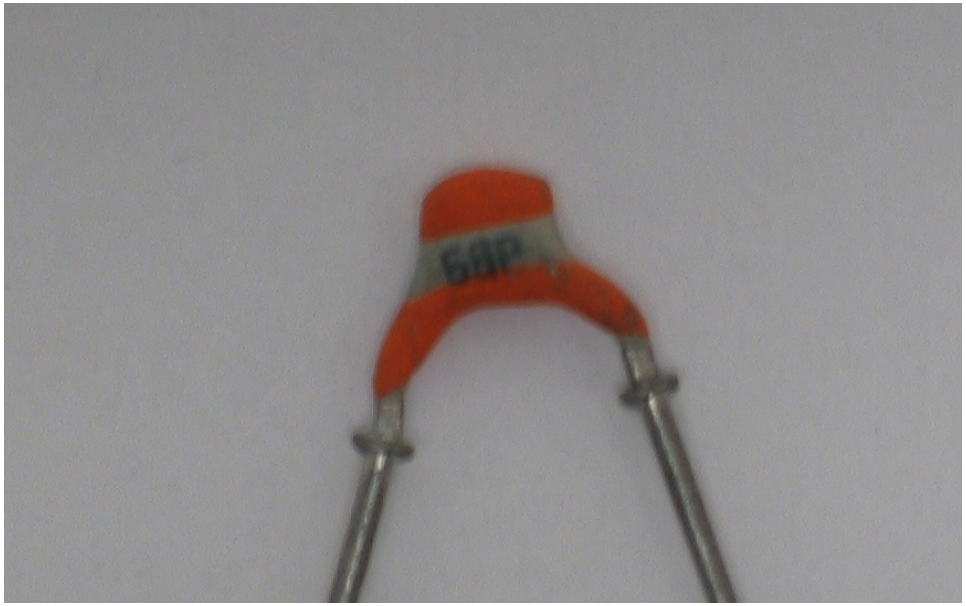


This has the value, $10\mu F$, written on it.


68P



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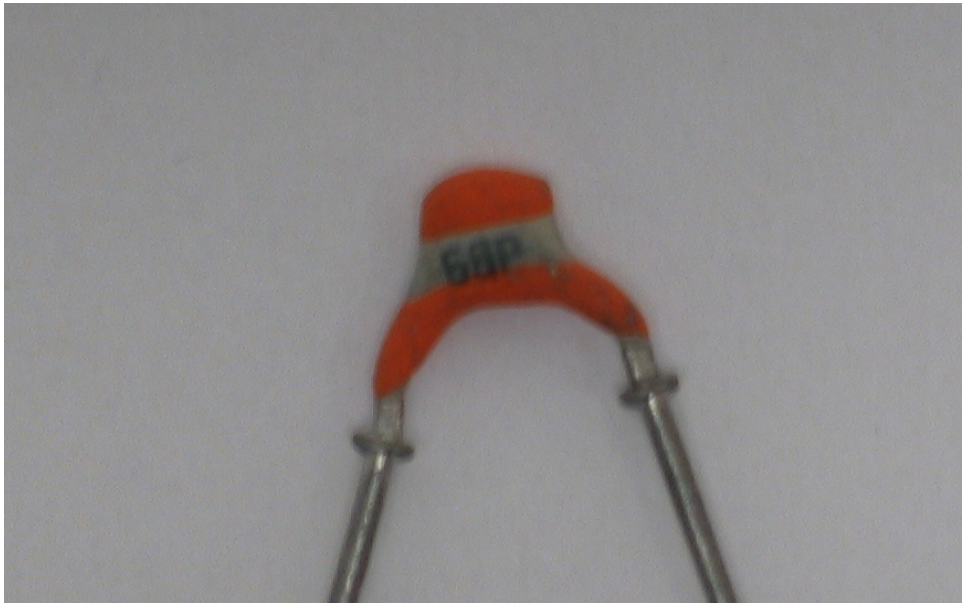

This one indicates 68 pF. (The *p* to the right means the decimal is to the right and it's in picoFarads.)


П68

This one indicates 0.68 nF, (or 680 pF).

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100

This one indicates 1.0 nF.

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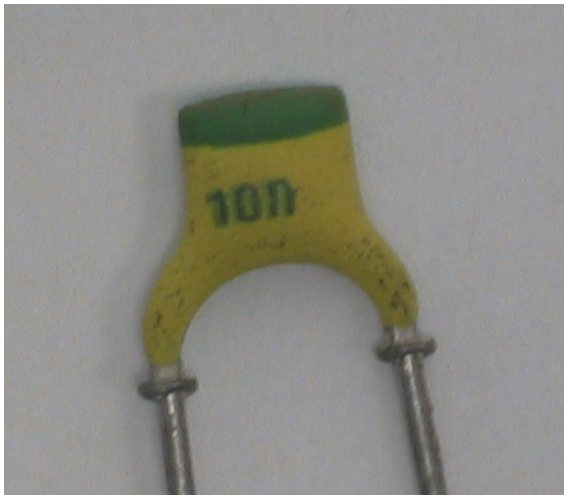
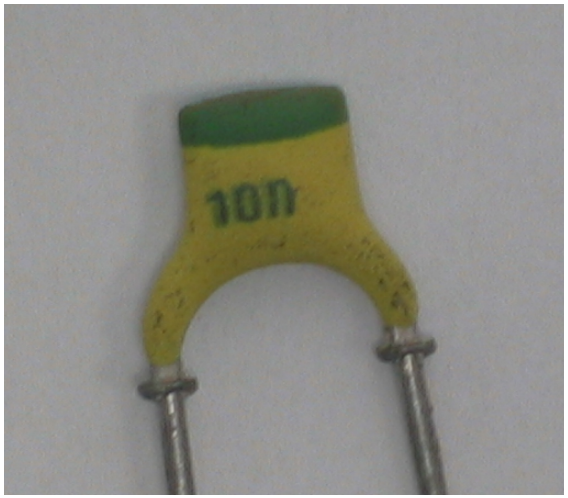

10n



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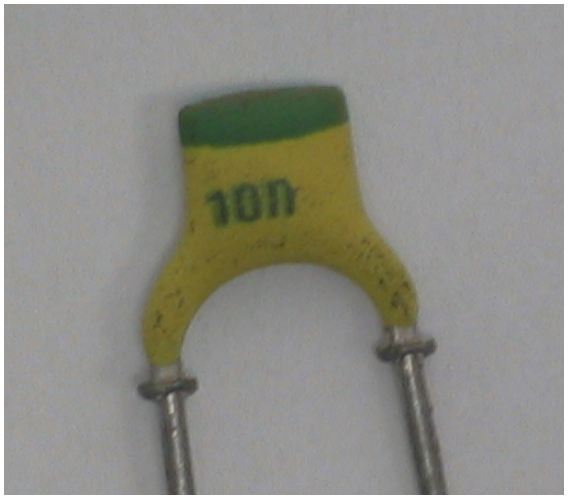

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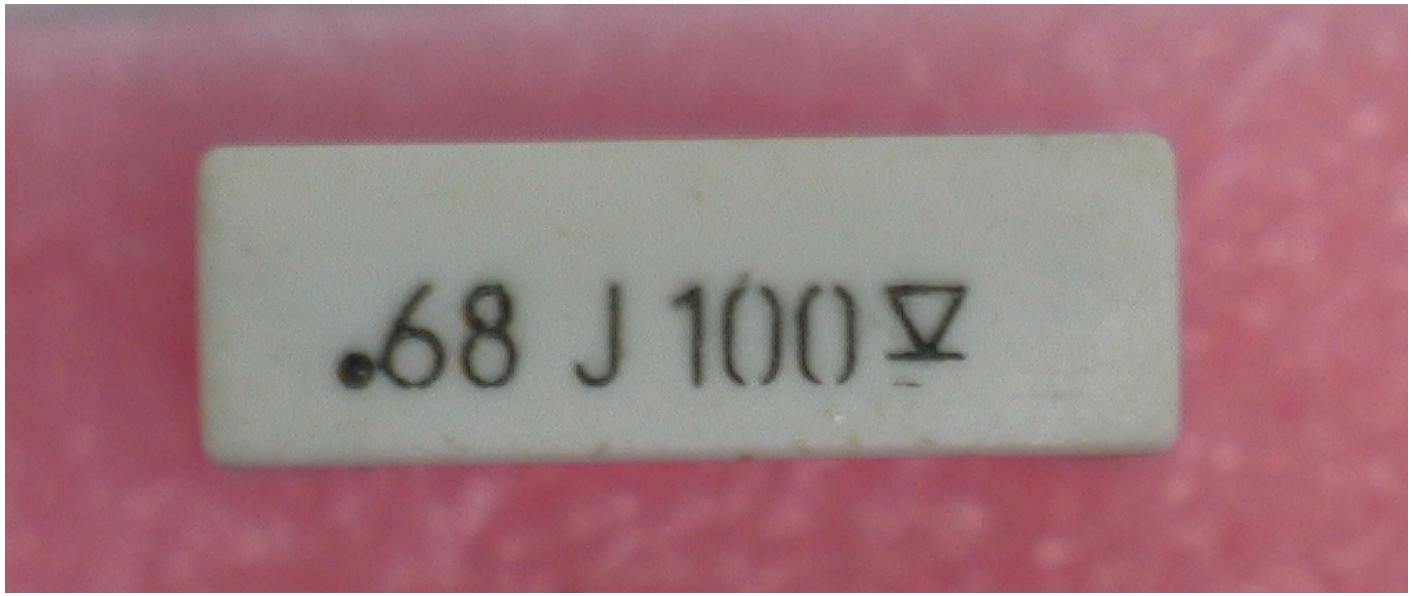
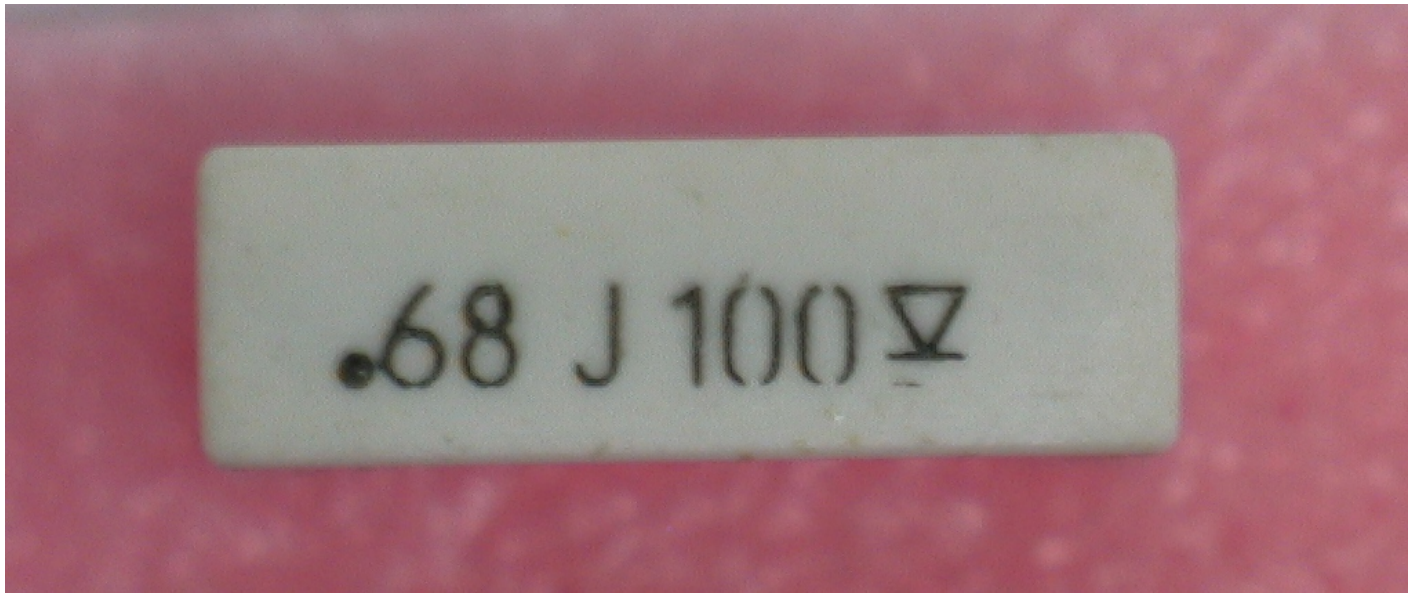
MAC
0,01 K
100V

This is a $0.01\mu F$ capacitor. The "K" indicates a 10% tolerance.


.68 J 100



This is a $0.68\mu F$ capacitor. The "J" indicates a 5% tolerance.


103J

This one gives the value in picoFarads, with the 3 numbers handled as for resistors.

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