

# The circledsteps package: circled numbers, circled steps and more

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## 1 Introduction

This package was born thanks to the discussion on [tex.stackexchange.com](https://tex.stackexchange.com), and with the help of the several authors that contributed to the answers. The base idea is to have a command that can create arbitrary “circled” text (numbers or letters) and that can work in normal text **and** in a node in a `tikzpicture` or derivative. That forbid to use `TikZ` itself for the circles — you can’t safely nest `tikzpictures`.

This package provides two things: the first one, macros to generate the circled text that use the original `pict2e` method, and then a (simple, to be taken as an example) set of macro to generate sequential circled numbers that can be referenced afterward.

## 2 Basic commands

The basic commands are:

<code>\Circled{}</code>	circled text using the package colors, text on the baseline
<code>\CircledTop{}</code>	circled text using the package colors, circle on the baseline
<code>\CircledText{}</code>	circled text using the current color (may fail <sup>1</sup> in moving arguments)

The parameters for the output are controlled using `pgfkeys`; you can change them with `\tikzset`; you can obviously limit the effect of change using normal `LATEX` scoping rules.

Parameter	Meaning	Default value
<code>/csteps/inner ysep</code>	vertical spacing	4pt
<code>/csteps/inner xsep</code>	horizontal spacing	4pt
<code>/csteps/inner color</code>	color of the text	red
<code>/csteps/outer color</code>	color of the circle	blue

The working of the package is better explained with examples.

This is normal text: ① is on the baseline, ② is on top.  
This is more evident if you have descendents, like p:Ⓟ and Ⓟ.

<sup>1</sup>This is normal text: `\Circled{1}` is on the baseline, `\CircledTop{2}` is on top.

<sup>2</sup>

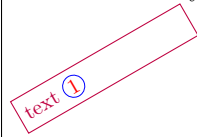
<sup>3</sup>This is more evident if you have descendents, like `p:\Circled{p}` and `\CircledTop{p}`.

<sup>1</sup>in the sense it can select the wrong color.

For big horizontal things the circle becomes oval:  $\textcircled{200}$  or  $\textcircled{199}$ .

1 For big horizontal things the circle becomes oval:  $\textcircled{200}$  or  $\textcircled{199}$ .

Inside tikz they work ok:



```
1 Inside \texttt{tikz} they work ok:
2
3 \begin{tikzpicture}[scale=0.8, rotate=30,
4   text width=3cm, transform shape]
5   \node [draw,color=purple]{text \textcircled{1}};
6 \end{tikzpicture}
```

If you like more breathing space:  $\textcircled{1}$   $\textcircled{2}$   $\textcircled{p}$   $\textcircled{200}$   $\textcircled{199}$ .

```
1 \tikzset{/csteps/inner ysep=10pt}
2 \tikzset{/csteps/inner xsep=10pt}
3 If you like more breathing space:
4 \Circled{1} \Circled{2} \Circled{p} \Circled{200} \Circled{199}.
5 \par\bigskip
```

If you want to change colors it's easy:  $\textcircled{1}$   $\textcircled{2}$   $\textcircled{p}$   $\textcircled{200}$   $\textcircled{199}$ .

```
1 \tikzset{/csteps/inner color=green}
2 \tikzset{/csteps/outer color=gray}
3 If you want to change colors it's easy:
4 \Circled{1} \Circled{2} \Circled{p} \Circled{200} \Circled{199}.
5 \par\bigskip
```

Or even you can have inline numbers like  $\textcircled{1}$  or exponents <sup>$\textcircled{2}$</sup>  and so on. They follow the current color:  $\textcircled{1}$  and  $\textcircled{2}$  automatically, as you can see:  $\textcircled{1+1 \approx 3}$ . In-text circled numbers look better when a bit smaller, though, as you can see in  $\textcircled{1}$  for example.

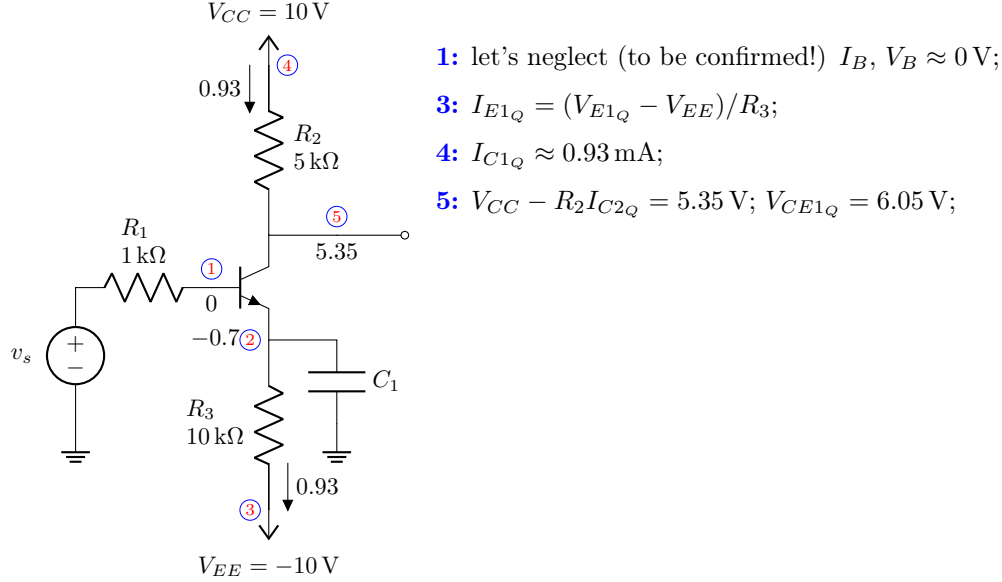
```
1 Or even you can have inline numbers like \CircledText{1} or
2 exponents\textsuperscript{\CircledText{2}} and so on.
3 \textcolor{red}{They follow the current color: \CircledText{1} and \CircledText{2}
   automatically,} as you can see: \CircledText{\$1+1\approx3\$}. In-text circled
   numbers look better when a bit smaller, though, as you can see in {\small\
   CircledText{1}} for example.
```

Notice that  $\textcircled{\text{CircledText}}$  uses the special “.” color defined by `xcolor`; when page breaks occurs it can get the wrong color.

No, you can't fill the circle/oval. Pull requests in that sense are welcome.

### 3 Automatically generated numbers

The command `\cstep` will generate a circled number, starting from 1, that can be referenced with the normal `\label` mechanism. You can reset the numbering with `\startcstep`. For example:



```

1 \begin{circuitikz}[scale=0.9, baseline=(VCC), transform shape]
2   \draw (0,0) node[ground] (GND){} to[V=$v_s$] ++(0,2)
3   to[R, l2_=$R_1$ and \SI{1}{k\ohm}, l2 valign=b] ++(2,0) coordinate(firstb);
4   \node [above] at(firstb) {\cstep\label{c:b1}};
5   \node [below] at(firstb) {0};
6   \draw (firstb) node[npn, anchor=B] (Q1){};
7   \draw (Q1.E) node[left]{\num{-0.7}\cstep};
8   \draw (Q1.C) to[R, l2_=$R_2$ and \SI{5}{k\ohm}, f<=\num{0.93}] ++(0,2.5)
9   node[vcc] (VCC){$V_{CC}=\SI{10}{V}$} ;
10  \draw (Q1.E) to[R, l2_=$R_3$ and \SI{10}{k\ohm},
11  f=\num{0.93}] ++(0,-2.5) node[vee] (VEE){$V_{EE}=\SI{-10}{V}$}
12  node[left]{\cstep\label{c:ie1}};
13  \path (VCC) node[right]{\cstep\label{c:ic1}};
14  \draw (Q1.E) -- ++(1,0) coordinate(tmp) to[C=$C_1$] (tmp |- GND) node[ground]{};
15  \draw (Q1.C) -- ++(1,0) coordinate(g1) to[short, -o] ++(1,0);
16  \node [above] at(g1) {\cstep\label{c:g1}};
17  \node [below] at(g1) {\num{5.35}};
18 \end{circuitikz}\quad
19 \begin{minipage}[t]{0.5\linewidth}
20   %% minipage reset these..
21   \parindent=0pt\parskip=6pt plus 6pt minus 2pt\relax
22   \ref{c:b1} let's neglect (to be confirmed!)  $I_B, V_B \approx 0\text{ V}$ ;\par
23   \ref{c:ie1}  $I_{E1Q} = (V_{E1Q} - V_{EE})/R_3$ ;\par
24   \ref{c:ic1}  $I_{C1Q} \approx 0.93\text{ mA}$ ;\par
25   \ref{c:g1}  $V_{CC} - R_2 I_{C2Q} = 5.35\text{ V}; V_{CE1Q} = 6.05\text{ V}$ ;\par
26 \end{minipage}

```

## 4 Personalize it!

The definition of `CircledText` is simply the following one; you can get idea and define your own easily (beware of spaces at the end of the lines, though!):

```
1 \newcommand{\CircledText}[1]{%
2   \beginpgroup
3   \tikzset{/csteps/inner color=., /csteps/outer color=.%}
4   \Circled{#1}%
5   \endpgroup
6 }
```

Also the implementation of the `\cstep` command and relatives is quite simple, and you can play a lot with it to change things (formats, colors, the type of numbering, and so on):

```
1 \newcounter{cstepcnt}
2 \newcommand{\startcstep}{\setcounter{cstepcnt}{0}}
3 \newcommand{\resetcstep}{\setcounter{cstepcnt}{0}}
4 \newcommand{\cstep}{%
5   \refstepcounter{cstepcnt}%
6   \Circled{\scriptsize\arabic{cstepcnt}}}%
7 }
8 \renewcommand{\thecstepcnt}{\textbf{\arabic{cstepcnt}:}}
```