Abstract

This package which requires \texttt{\LaTeX}, provides macros for creating pinout diagrams of chips.


## 1 Introduction

### 1.1 Description

This package defines macros for generating symbolic pinout diagrams for different package classes, such as DIP, PLCC, etc.

### 1.2 Motivation

Whoever has ever had to do with FPGA or MCUs (whether for living and leisure), it’s just natural he or she might have been in a need to document some pins. So was my case and since I failed in finding any package in \LaTeX\ to suit my needs, I opted for creating one myself.

I hope others will find it as useful as it was to me and my colleagues.

This is my first \LaTeX\ package documentation ever - and since I hate reinventing the wheel - this manual has been based upon that of \texttt{xstrings} - with the courtesy of the author, of course.

## 2 The macros

For a better understanding, let’s see first the macros with the simpler arguments possible. No special catcode, no exotic token, no control sequence either: only alphanumeric chars will be contained in the arguments.

In the following chapters, all the macros will be presented this way:

- a short description of the operation;
- the operation under special conditions. For each conditions considered, the operation described has priority on that (those) below;
- finally, several examples are given. I tried to find them most easily comprehensible and most representative of the situations met in normal use.

**Important:** in the following, a \texttt{⟨number⟩} can be an integer written with numeric chars, a counter, or the result of an arithmetic operation made with the command \texttt{\numexpr}.

All the macros of pinouTikz are displayed in \textcolor{red}{red}.

### 2.1 The pinout diagrams

#### 2.1.1 \texttt{\PDIP}

\texttt{\PDIP(⟨pincount⟩){⟨pinarray⟩}}

Draws a PDIP package with generic number of pins.

- \texttt{⟨pincount⟩} the number of pins of a DIP package and should be an even number.
- \texttt{⟨⟨pinarray⟩⟩} is a comma-separated list of pins - each pin definition is as follows: \texttt{⟨pinnumber⟩/⟨pinlabel⟩}.

```latex
\begin{figure}
\centering
\PDIP(4){\%1/E,2/B,3/NC,4/C}
\caption{NPN-Transistor, 4-pin PDIP package} \label{fig:X_DIP4}
\end{figure}
```
Figure 1: NPN-Transistor, 4-pin PDIP package

\begin{figure}
\centering
\PDIP(8)\%
1/CLK, \\
2/A, \\
3/B, \\
4/GND, \\
5/Y, \\
6/{\FormatPinLabel{-Y-}}/RESET, \\
7/NC, \\
8/$V_{cc}$\%
\caption{TTL logic chip, 8-pin PDIP package} \label{fig:X_DIP8}
\end{figure}

Figure 2: TTL logic chip, 8-pin PDIP package

Figure 3: Generic programmable TTL logic chip, 14-pin PDIP package
\begin{figure}[ht]\
\centering
PDIP(14)\%
\begin{verbatim}
1/A1,
2/B1,
3/\FormatPinLabel{\#1 AND/-OR-/GPIO1},
4/Y1,
5/C1,
6/\FormatPinLabel{\#2 AND/-OR-/GPIO2},
7/GND,
8/PCLK,
9/PDAT,
10/A2,
11/B2,
12/\FormatPinLabel{\#2 INV/-SME-/GPIO3},
13/C2,
14/$V_{cc}$
\end{verbatim}
\caption{Generic programmable TTL logic chip, 14-pin PDIP package} \label{fig:X_DIP14}
\end{figure}

2.1.2 \texttt{TQFP}

\texttt{TQFP}(⟨pinnumber⟩){⟨pinarray⟩}

Draws a TQFP package with generic number of pins.

- ⟨pincount⟩ the number of pins of a DIP package and should be an even number.
- ⟨pinarray⟩ is a comma-separated list of pins - each pin definition is as follows: ⟨pinnumber⟩/⟨pinlabel⟩.
\begin{figure}[ht!]
\centering
\TQFP(32){% 
1/{PD.0/RTX1},
2/{PA.0/STX1},
3/PA.1,
4/PA.2,
5/PA.3,
6/PA.4,
7/PA.5,
8/GND,
9/PA.6,
10/PA.7,
11/{PB.0/RTX1},
12/{PB.1/STX1},
13/PB.2,
14/PB.3,
15/PB.4,
16/PB.5,
17/PB.6,
18/PB.7,
19/\FormatPinLabel{PC.0/-ALE-/PLPBC0},
20/PC.1,
21/PC.2,
22/PC.3,
23/PC.4,
24/PC.5,
25/PC.6,
26/PC.7,
27/XTAL1/PD.3,
28/XTAL2/PD.4,
29/RST,
30/PD.1,
31/PD.2,
32/$V_{cc}$
\caption{A generic MCU chip, 32-pin TQFP package} \label{fig:X_TQFP32} 
\end{figure}

Figure 4: A generic MCU chip, 32-pin TQFP package
2.1.3 \texttt{\textbackslash{PLCC}}

\texttt{\textbackslash{PLCC}}(⟨pinnumber⟩){⟨pinarray⟩}

Draws a PLCC package with generic number of pins.

- ⟨\texttt{pincount}⟩ the number of pins of a DIP package and should be an even number.
- {⟨\texttt{pinarray}⟩} is a comma-separated list of pins - each pin definition is as follows: ⟨\texttt{pinnumber}⟩/{⟨\texttt{pinlabel}⟩}.

```
\begin{figure}[ht!]
\centering
\texttt{\textbackslash{PLCC}(28)\%}
1/{PD.0/RTX1},
2/{PA.0/STX1},
3/PA.1,
4/PA.2,
5/PA.3,
6/PA.4,
7/PA.5,
8/GND,
9/PA.6,
10/PA.7,
11/{PB.0/RTX1},
12/{PB.1/STX1},
13/PB.2,
14/PB.3,
15/PB.4,
16/PB.5,
17/PB.6,
18/PB.7,
19/{\texttt{\textbackslash{FormatPinLabel}\{PC.0/-ALE-/PLPBC\}},
20/PC.1,
21/PC.2,
22/PC.3,
23/{XTAL1/PD.3},
24/{XTAL2/PD.4},
25/RST,
26/PD.1,
27/PD.2,
28/$V_{cc}$}\}
\caption{A generic MCU chip, 28-pin PLCC package}
\label{fig:X\_PLCC28}
\end{figure}
```

That’s all, I hope you will find this package useful!
Please, send me an email if you find a bug or if you have any idea of improvement...

Robert Blazek
Figure 5: A generic MCU chip, 28-pin PLCC package