

# pinouTikz

v1.1.0

User's manual

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## ***Abstract***

This package which requires  $\varepsilon$ -TEX, provides macros for creating pinout diagrams of chips.

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## 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  $\text{\LaTeX}$  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 **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  $\langle number \rangle$  can be an integer written with numeric chars, a counter, or the result of an arithmetic operation made with the command `\numexpr`.

All the macros of pinouTikz are displayed in **red**.

### 2.1 The pinout diagrams

#### 2.1.1 \PDIP

`\PDIP( $\langle pincount \rangle$ ){ $\langle pinarray \rangle$ }`

Draws a PDIP package, with generic number of pins.

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

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

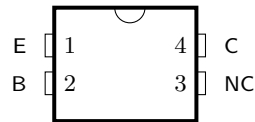


Figure 1: NPN-Transistor, 4-pin PDIP package

```

1 \begin{figure}
2   \centering
3   \PDIP(8){%
4     1/CLK,
5     2/A,
6     3/B,
7     4/GND,
8     5/Y,
9     6/{\FormatPinLabel{~Y~}/RESET},
10    7/NC,
11    8/$V_{cc}$%
12  }
13  \caption{TTL logic chip, 8-pin PDIP package} \label{fig:X_DIP8}
14 \end{figure}

```

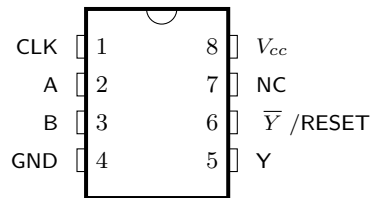


Figure 2: TTL logic chip, 8-pin PDIP package

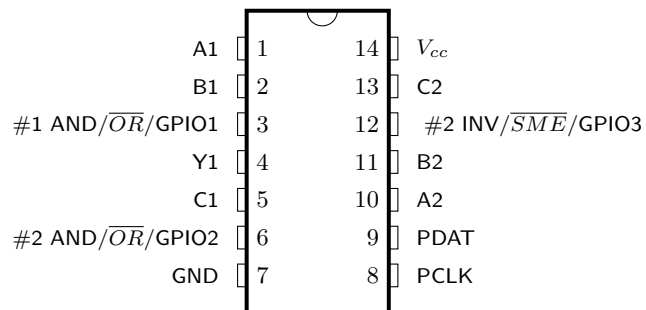


Figure 3: Generic programmable TTL logic chip, 14-pin PDIP package

```

1 \begin{figure}[ht!]
2   \centering
3   \PDIP(14){%
4     1/A1,
5     2/B1,
6     3/\FormatPinLabel{\#1 AND/~OR~/GPIO1},
7     4/Y1,
8     5/C1,
9     6/\FormatPinLabel{\#2 AND/~OR~/GPIO2},
10    7/GND,
11    8/PCLK,
12    9/PDAT,
13    10/A2,
14    11/B2,
15    12/\FormatPinLabel{\#2 INV/~SME~/GPIO3},
16    13/C2,
17    14/$V_{cc}$}
18   \caption{Generic programmable TTL logic chip, 14-pin
19     PDIP package} \label{fig:X_DIP14}
20 \end{figure}

```

### 2.1.2 \TQFP

\TQFP(*<pinnumber>*){*<pinarray>*}

- *<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>*.

```

1 \begin{figure}[ht!]
2   \centering
3   \TQFP(32){%
4     1/{PD.0/RTX1},
5     2/{PA.0/STX1},
6     3/PA.1,
7     4/PA.2,
8     5/PA.3,
9     6/PA.4,
10    7/PA.5,
11    8/GND,
12    9/PA.6,
13    10/PA.7,
14    11/{PB.0/RTX1},
15    12/{PB.1/STX1},
16    13/PB.2,
17    14/PB.3,
18    15/PB.4,
19    16/PB.5,
20    17/PB.6,
21    18/PB.7,
22    19/\FormatPinLabel{PC.0/~ALE~/PLPBC0},
23    20/PC.1,
24    21/PC.2,
25    22/PC.3,
26    23/PC.4,
27    24/PC.5,
28    25/PC.6,
29    26/PC.7,
30    27/XTAL1/PD.3,
31    28/XTAL2/PD.4,
32    29/RST,
33    30/PD.1,
34    31/PD.2,
35    32/$V_{cc}$}
36   \caption{A generic MCU chip, 32-pin TQFP package} \
37   \label{fig:X_TQFP32}
38 \end{figure}

```

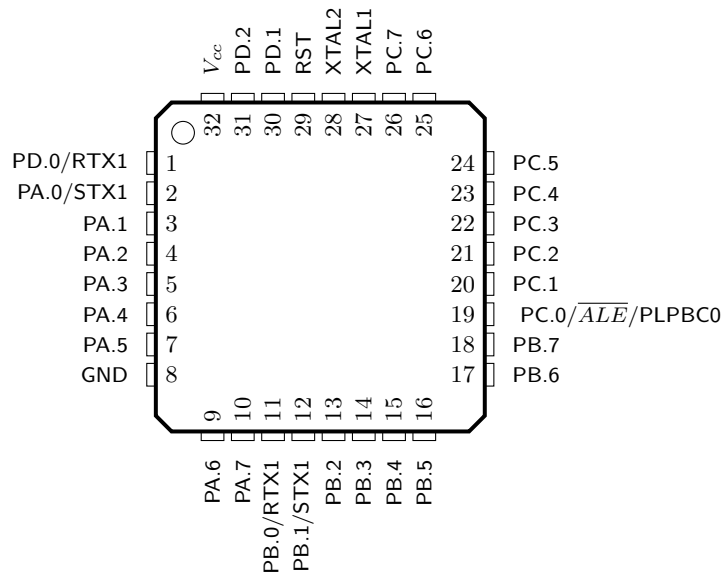


Figure 4: A generic MCU chip, 32-pin TQFP package

### 2.1.3 \PLCC

`\PLCC(<pinnumber>){<pinarray>}`

- `<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>`.

```
1 \begin{figure}[ht!]  
2   \centering  
3   \PLCC(28){%  
4     1/{PD.0/RTX1},  
5     2/{PA.0/STX1},  
6     3/PA.1,  
7     4/PA.2,  
8     5/PA.3,  
9     6/PA.4,  
10    7/PA.5,  
11    8/GND,  
12    9/PA.6,  
13    10/PA.7,  
14    11/{PB.0/RTX1},  
15    12/{PB.1/STX1},  
16    13/PB.2,  
17    14/PB.3,  
18    15/PB.4,  
19    16/PB.5,  
20    17/PB.6,  
21    18/PB.7,  
22    19/\FormatPinLabel{PC.0/~ALE~/PLPBC0},  
23    20/PC.1,  
24    21/PC.2,  
25    22/PC.3,  
26    23/{XTAL1/PD.3},  
27    24/{XTAL2/PD.4},  
28    25/RST,  
29    26/PD.1,  
30    27/PD.2,  
31    28/$V_{cc}$}  
32   \caption{A generic MCU chip, 28-pin PLCC package} \label{fig:X_PLCC28}  
33 \end{figure}
```

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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

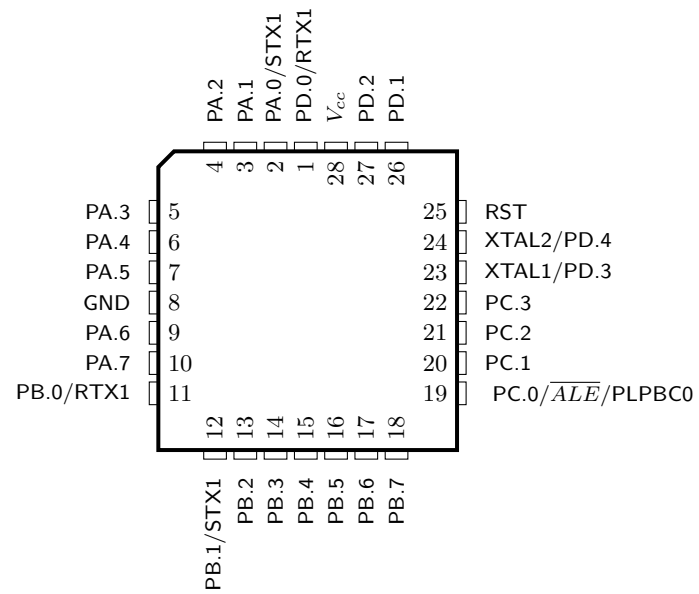


Figure 5: A generic MCU chip, 28-pin PLCC package