

DETAIL Solution 5

40 **VBUS**

39 **VSYS**

38 **GND**

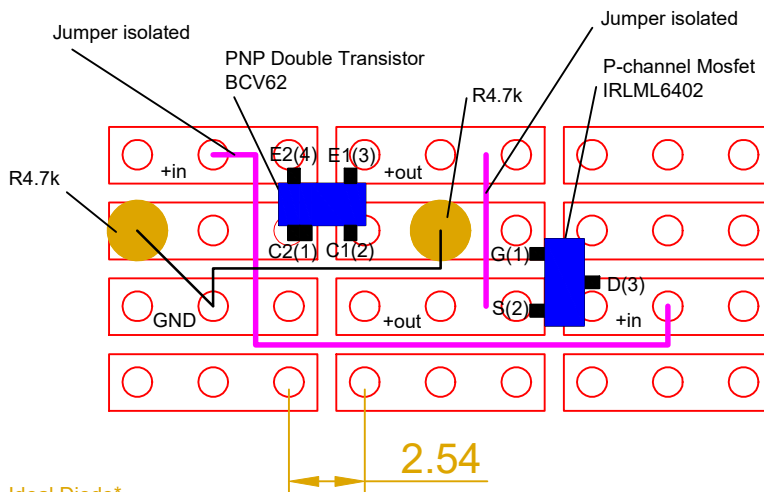
37 **3V3EN**

36 **3V3**

35

3.3V >>>
max. 300mA

Close to the Ideal Diode



Ideal Diode*

The ideal diode, consisting of a P-channel Mosfet and a PNP double transistor, can reduce the loss voltage down to 0.05V. For this example the IRLML6402 and the BCV62 are used.

For more details see:

<https://praktische-elektronik.dr-k.de/Praktikum/Analog/DiodenTransistoren/Le-Ideale-Diode.html>
Sorry only in German, use Google Translate.

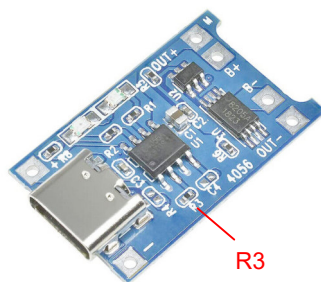
2023-10-28gt

Popular Battery Charger

Based on chipset TC4056A

R3 can be changed for charging currents other than 1000 mA.

- 30 kΩ = 50 mA
- 20 kΩ = 70 mA
- 10 kΩ = 130 mA
- 5 kΩ = 250 mA
- 4 kΩ = 300 mA
- 3 kΩ = 400 mA
- 2 kΩ = 580 mA
- 1.5 kΩ = 780 mA
- 1.33 kΩ = 900 mA
- 1.2 kΩ = 1000 mA



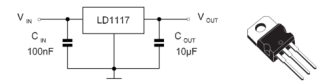
Voltage Regulators Solution 4

Digital Step-Down Regulators



High efficiency (> 93%) but also voltage ripples. This prevents high quality analog use cases.

Low Drop Regulators



Lower efficiency (> 73%). For high quality analog use cases.

Examples:

LD1117	0.8A	DV = 1.20V	73%
TS2940	1.0A	DV = 0.06V to 0.6V	
LF33CV	0.5A	DV = 0.45V	88%

Dropout Voltages of LF33CV
 $I_o = 200 \text{ mA typ. } 0.2\text{V max. } 0.35\text{V}$
 $I_o = 500 \text{ mA typ. } 0.4\text{V max. } 0.70\text{V}$

