USB-C +5/-5v pOWER MODULE

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# Zadání

Symetrický +5/-5V napájecí modul, napájený přes USB Type-C konektor. 1,5+ ampér na pozitivní větvi, 1+ ampér na negativní větvi.

# revize + aktuální problémy

### 13.3.2018 – Rev. 2

* Opraven/přidán filtr na negativní feedback pro stabilizaci
* Změna elektrolitických kondenzátorů na tantalové
* Lehké úpravy layoutu

### 26.8.2018 – Rev. 1

* První návrh
* Negativní větev nereguluje správně – osciluje feedback – fix (přidat 100k odpor do série na negativní feedback)
* Netestováno na full load

# BOM(Rev.2)

|  |  |  |  |
| --- | --- | --- | --- |
| Reference | Qty | Part | Link |
| U1 | 1 | TI TPS65131 | [Farnell](https://cz.farnell.com/texas-instruments/tps65131rget/ic-conv-dc-dc-pos-neg-24-qfn/dp/1755480) |
| U2 | 1 | TI LM2940CSX-5.0/NOPB | [Farnell](https://cz.farnell.com/texas-instruments/lm2940csx-5-0-nopb/ldo-volt-reg-1a-5v-to-263-3/dp/2783569) |
| U3 | 1 | LM2990S-5.0 | [Farnell](https://cz.farnell.com/texas-instruments/lm2990s-5-0-nopb/ic-v-reg-linear-5v/dp/1469082) |
| D1, D2 | 2 | VISHAY B340A-E3/61T – 3A, Schottky | [Farnell](https://cz.farnell.com/vishay/b340a-e3-61t/rectifier-standard-3a-40v-do-214ac/dp/2335183) |
| C1, C3, C10, C12-C18 | 11 | 4.7uF, 25V, X7R, Ceramic, 1210 SMD | [Farnell](https://cz.farnell.com/kemet/c1210x475k3ractu/cap-mlcc-4-7uf-25v-1210/dp/2906192) |
| C2 | 1 | 100nF, 50V, X7R, Ceramic, 0603 SMD | [Farnell](https://cz.farnell.com/vishay/ga0603y104kbaat31g/cap-mlcc-aec-q200-x7r-0-1uf-0603/dp/2896285) |
| C7, C9 | 2 | 12pF, 50V, X7R, Ceramic, 0603 SMD | [Farnell](https://cz.farnell.com/kemet/c0603c120k5ractu/cap-mlcc-x7r-12pf-50v-0603/dp/2821150) |
| C6 | 1 | 220nF, 16V, X5R, Ceramic, 0603 SMD | [Farnell](https://cz.farnell.com/wurth-elektronik/885012106013/cap-mlcc-x5r-0-22uf-16v-0603/dp/2812268) |
| C5 | 1 | 10nF, 25V, X7R, Ceramic, 0603 SMD | [Farnell](https://cz.farnell.com/yageo/cc0603krx7r8bb103/cap-mlcc-x7r-10nf-25v-0603/dp/3019561) |
| C8 | 1 | 4.7nF, 50V, X7R, Ceramic, 0603 SMD | [Farnell](https://cz.farnell.com/kemet/c0603c472j5ractu/cap-mlcc-x7r-4700pf-50v-0603/dp/2409042) |
| C4, C11 | 2 | 47uF Tantal, 25V, Kemmet-D (2917) SMD | [Farnell](https://cz.farnell.com/kemet/t491x476k025at/cap-47-f-25v-10-2917-smd/dp/1457545) |
| L1 | 1 | KEMET MPLC0730L2R2 | [Farnell](https://cz.farnell.com/kemet/mplc0730l2r2/inductor-power-2-2uh-20-smd/dp/2364586) |
| L2 | 1 | KEMET MPLC0730L3R3 | [Farnell](https://cz.farnell.com/kemet/mplc0730l3r3/inductor-power-3-3uh-20-smd/dp/2364592) |
| R1 | 1 | 100R resistor, 0603 SMD | [Farnell](https://cz.farnell.com/yageo/rc0603fr-07100rl/res-100r-0-01-0-1w-0603-thick/dp/9238360) |
| R2, R5 | 2 | 130K resistor, 0603 SMD | [Farnell](https://cz.farnell.com/panasonic-electronic-components/erj3geyj134v/res-130k-0-05-0-1w-0603-thick/dp/2059658) |
| R4 | 1 | 536K resistor, 0603 SMD | [Farnell](https://cz.farnell.com/multicomp/mcwr06x5363ftl/res-536k-0-01-0-1w-0603-thick/dp/2694894) |
| R3 | 1 | 665K resistor, 0603 SMD | [Farnell](https://cz.farnell.com/panasonic-electronic-components/erj3ekf6653v/res-665k-1-100mw-0603-thick-film/dp/2303304) |
| R6 | 1 | 100K resistor, 0603 SMD | [Farnell](https://cz.farnell.com/multicomp/mcwr06x1003ftl/res-100k-1-0-1w-0603-thick-film/dp/2447226) |
| J1 | 1 | AMPHENOL 12401548E4-2A | [Farnell](https://cz.farnell.com/amphenol-icc-commercial-products/12401548e4-2a-500/usb-connector-3-1-type-c-rcpt/dp/2564554) |