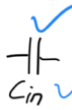
Power supply notes:

5V regulator current: 200mA; 1.4 W
Adjustable regulator: Imax = 50mA
PNP base current: Ib = 30mA

150
100 µH (L20) 400mA @ ~28V
94mΩ, SRF: 1.1MHz, 0.76A
about 1MHz seems good
use ferrite EP or iron toroid core

72-144 µF, low ESR
- ESR ≤ 100mΩ
- V ≥ 20V
- I_{ripple} ≥ 400mA

Schottky MBR150 ?
$V_{reverse}$ ≥ 50V
I_{avg} ≥ 500mA



10-100µF
- ESR ≤ 300mΩ
- RMS Ripple current ≥ 250mA
- Voltage ≥ 50V

HF
100nF
- ESR ≤ 60mΩ
- Voltage ≥ 50V

0.01µF, 50V

5V regulator Heat sink:
250mA @ 7V = 1.75W

1.75W · 4 C°/W = 7 C° rise

Allows 38°C rise at 1.75W & 80° C° $t_{j\,max}$

~50mA headroom

Adj regulator heat sink:

100mA @ 28V = 2.8W

50mA @ 27V = 1.35W

2.8W · 4 C°/W = 11.2 C° rise

Allows 33.8° C° heatsink rise for 2.8W & 80° C° t_{max}

60mA @ 27V = 1.62W

1.62W · 4 C°/W = 6.5 C° rise

For chosen BZ111-039 (t_{amb}=35°)

@ 2.8W (100mA) $T_{j\theta}$ = 101 C°

@ 1.62W (60mA) $T_{j\theta}$ = 77 C°

TO-3 PNP heat sink:

3A @ 26V = 78W

78W · 1 C°/W = 78 C° rise

Ambient Max

78° + 35° = 113 C°

desired $t_{j\theta max}$

113 C° − 150 C° = 37°

$\frac{37°}{78W}$ = 0.47 C°/W

0.5 C°/W = 39° Δt → 153° $t_{j\theta max}$

heat-sink thermal resistance

(TO-3P) NTW0302G

TO-247 X2 heatsink

1.5A @ 26V = 39W

39W · 1.0 C°/W = 39 C°

Ambient max

39° + 35° = 74 C°

110° − 74° = 36°

$\frac{42°}{78W}$ = 0.46 C°/W → 106 C° @ t_{amb} = 35°; 96 C° @ 25° t_{amb}

NJW1302G

0.825 w/ Rθcs

39W · 0.825 C°/W = 32.2

32° + 35° = 67°

$t_{j\,max}$

110° − 67° = 43°

$\frac{43°}{78W}$ = 0.55 C°/W

https://www.ebay.com/itm/Radiator-Aluminum-Heatsink-Extruded-Profile-Heat-Sink-for-Electronic-Chipset-1PC/263706805477?epid=17004283299&hash=item3d662684e5:g:5BgAAOSwc~5bBUOk

↑ Gives 0.66 °C/W @ 600 LFM when cut to 100 mm
Gives 0.5 °C/W @ 300 LFM when full 150 mm

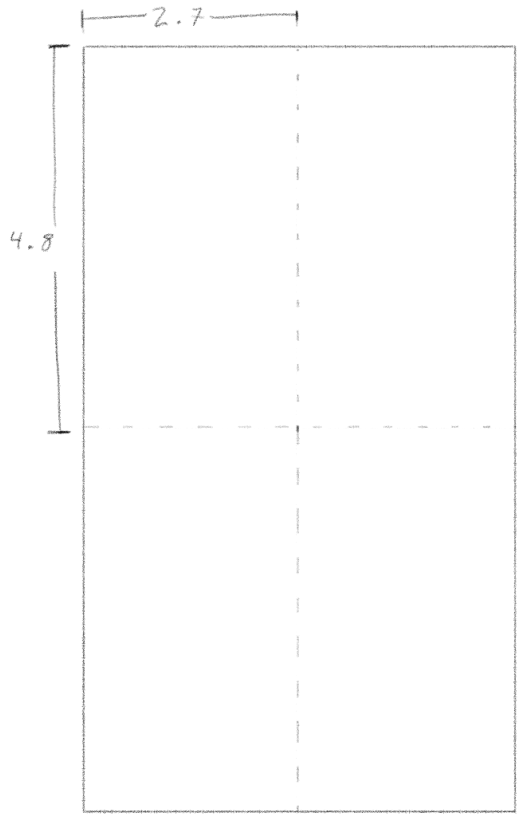
Sense Resistor:
$\frac{3A}{5} = 0.6V$ Full Scale

$R = \frac{0.6V}{3A} = 0.2\Omega$ gives $1\ A/V$ & dissipates $1.8W$

Check:
$100mA \cdot 0.2\Omega = 0.02V$
$0.02V \cdot 5 = 100mV$

Molex Connector Package:

mm



For outline:

(-2.7, 0) (-2.7, 4.8) (2.7, 4.8) (2.7, -4.8) (-2.7, -4.8) (-2.7, 0)

For silkscreen (1mm total gap)

(-3.2, -5.3) (-3.2, 5.3) (3.2, 5.3) (3.2, -5.3) (-3.2, -5.3)

mm