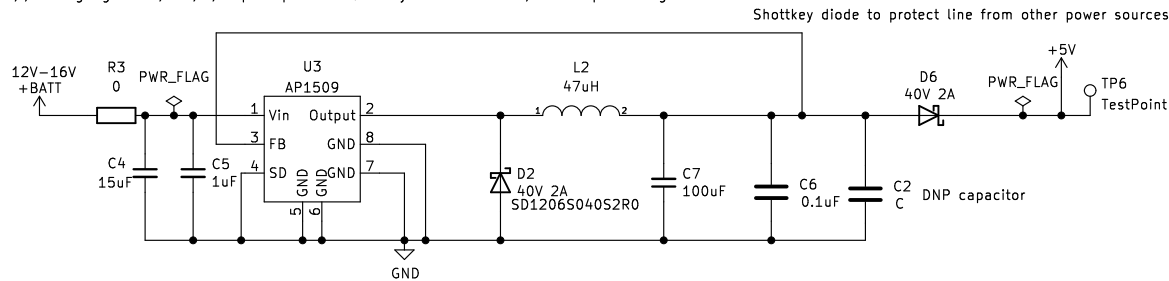
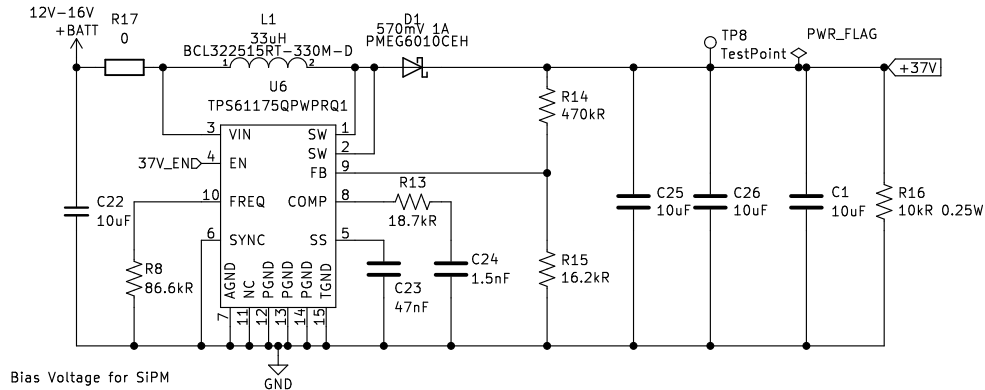


AP1509 is a buck converter.
Iout: 2A
Values are taken from datasheet.
PDF version:
<https://drive.google.com/file/d/13pYM-p7NzZnNQYXknj9P6BV4uZ4R9wv/view?usp=sharing>

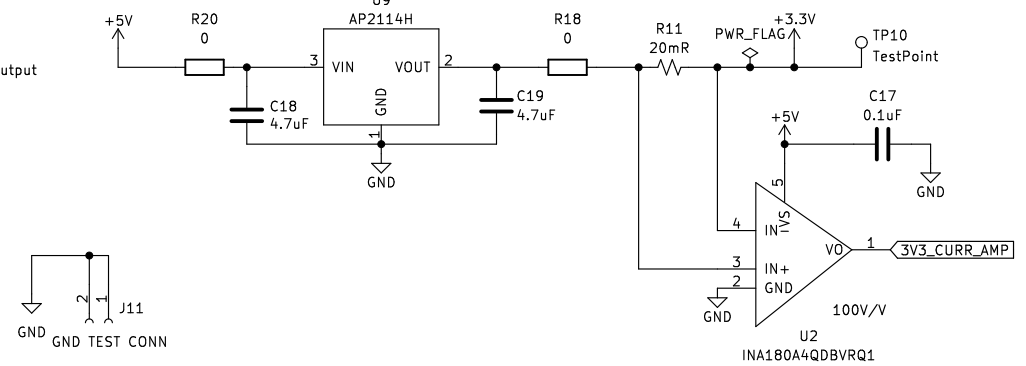


TPS61175 is a boost converter.
Max Iout rating: 3A
Values are taken from WEBENCH power designer
<https://webench.ti.com/appinfo/webench/scripts/SDP.cgi?ID=944A159EFA65DE89>
PDF version:
<https://drive.google.com/file/d/1ktwurg3Bjmdxpc3J00zTu8lIix18m34/view?usp=sharing>

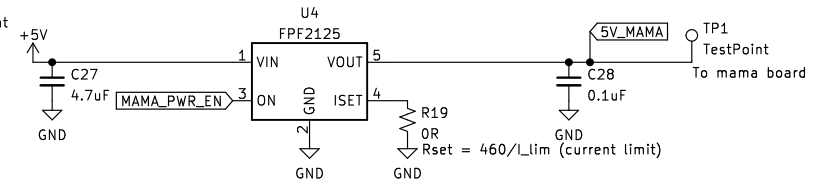


MCU, CAN, SDCard power supply
 $66.25\text{mR} \times I \times 200\text{V/V} = 5.3\text{V}$
 $I_{\text{max}} = 400\text{mA}$

AP2114H is a 3.3V LDO
Max Iout rating = 1A



Mama board 5V power switch



MAMA_PWR_EN set by MCU, HIGH = power to mama board, LOW = no power to mama board

VIH = 1.3V when Vin = 5.5V, so will turn on with 3V3 logic

I min for the boost converter to operate in PWM mode is 3mA
Choose 10k resistor, 5% tol:
Worst-case (max) resistance = $10000\text{ohm} \times (1 + 0.05) = 10500\text{ ohms}$
 $I_{\text{min}} = 37\text{V}/10500\text{ ohms} = 3.5\text{mA} \rightarrow$ above min load current for PWM operation

Worst-case (min) resistance = $10000\text{ ohms} \times 0.95 = 9500\text{ ohms}$
Max power = $(37^2)/(9500) = 0.144\text{ W}$

