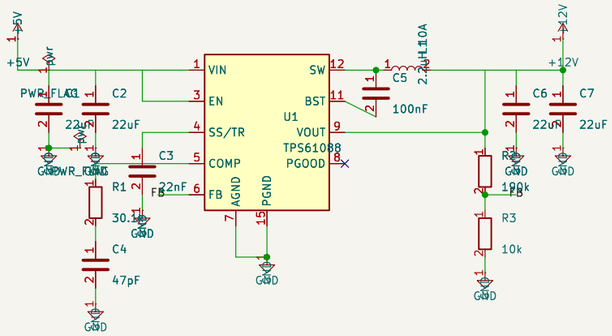


TPS61088 Boost Converter Reference Design

Input: +5V from Raspberry Pi 5V bus
Output: +12V @ 2A for A4988 stepper driver (VMOT)

VOUT = 0.6V x (1 + R2/R3) = 0.6 x (1 + 190k/10k) = 12.06V

Component Selection:
- L1: 2.2uH, >=10A Isat, low DCR (Coilcraft XAL7030-222ME)
- C1-C2, C6-C7: 22uF 25V X5R ceramic (input & output)
- C5: 100nF bootstrap (ceramic)
- C3: 22nF soft-start (sets startup ramp time)
- R1, C4: Loop compensation (see TPS61088 datasheet Table 2)

PCB Layout Notes:
- Keep SW node, BST cap, and inductor loop as tight as possible
- Place input and output caps directly adjacent to IC pins
- Solid ground plane under IC with thermal vias to EP pad
- Route FB trace far from SW/inductor (sensitive to noise)

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