

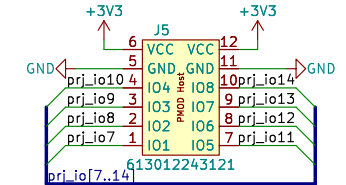
Caravel M.V.PCB

Sample of a minimum viable PCB for ASICs with Caravel on QFN. The REQUIRED support elements are:

- * power: regulated 3v3 and 1v8
 - * flash: some memory for executable
 - * osc: a CMOS clock signal
- and a way to access the HK SPI is a good idea. Everything else is optional.

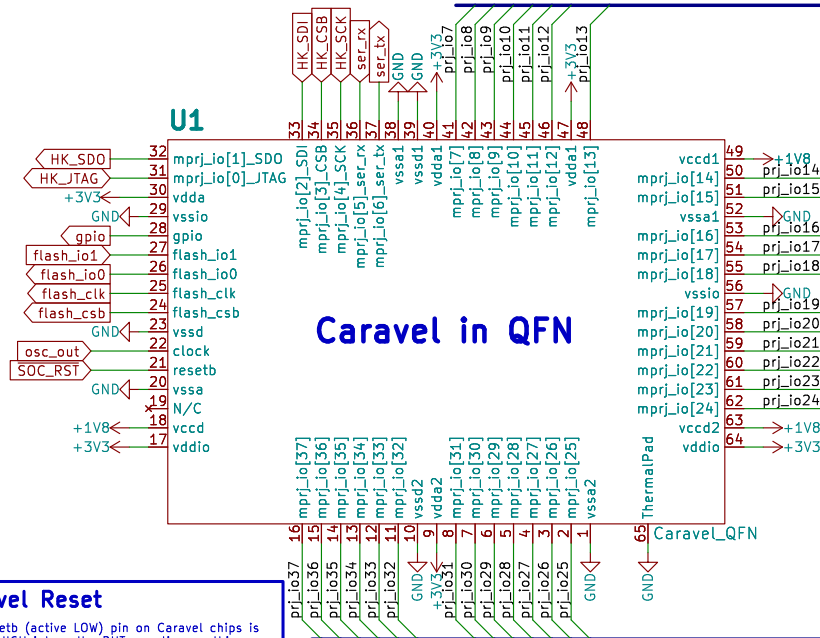
REQUIRED
OPTIONAL

I/O headers

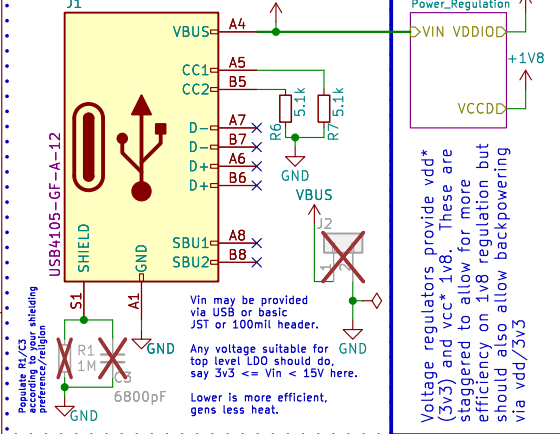


Sample I/O headers give access to all gpio pins from mprij_io[7] to mprij_io[37], on either the PMOD or the 2x18. Modify as required.

Caravel in QFN



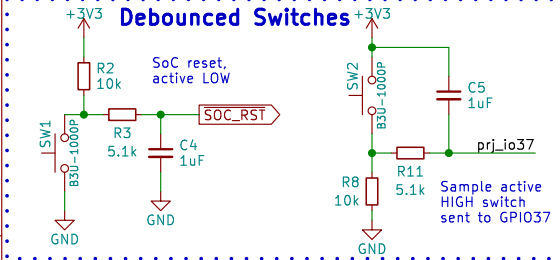
Power Supply



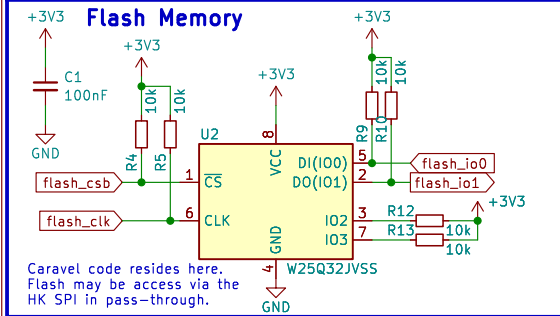
Vin may be provided via USB or basic JST or 100mil header. Any voltage suitable for top level LDO should do, say 3v3 <= Vin < 15V here. Lower is more efficient, gens less heat.

Voltage regulators provide vdd* (3v3) and vcc* 1v8. These are staggered to allow for more efficiency on 1v8 regulation but should also allow backpowering via vdd/3v3

Debounced Switches



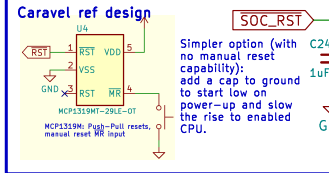
Flash Memory



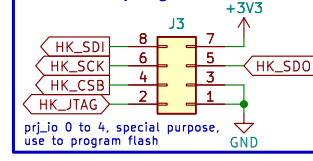
Caravel code resides here. Flash may be access via the HK SPI in pass-through.

Caravel Reset

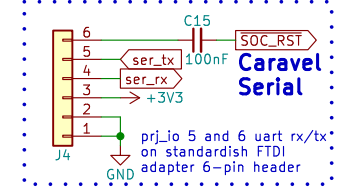
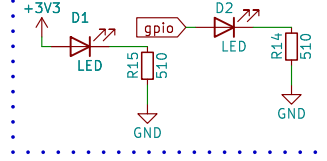
The resetb (active LOW) pin on Caravel chips is pulled HIGH internally, BUT counting on this is glitchy and dangerous. Caravel reference designs use a MCP1319M, as shown here, as a voltage supervisor to manage this and allow debounced reset switch.



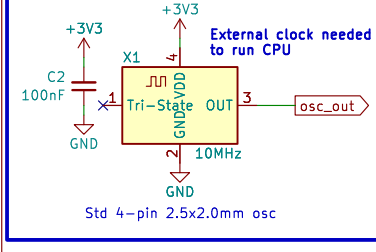
Housekeeping SPI



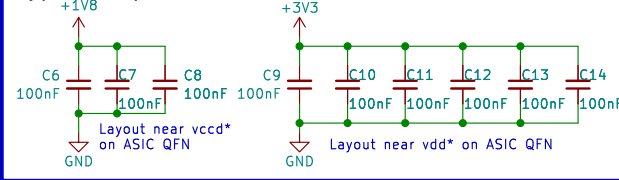
Power Good and GPIO LED



CMOS Clock Osc



Bypass Caps



Fids for PnP

- FID1 Fiducial
- FID2 Fiducial
- FID3 Fiducial

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Sheet: /
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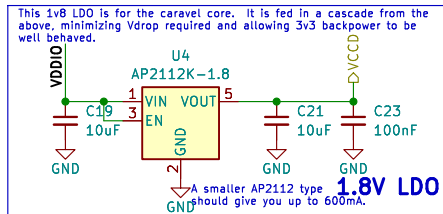
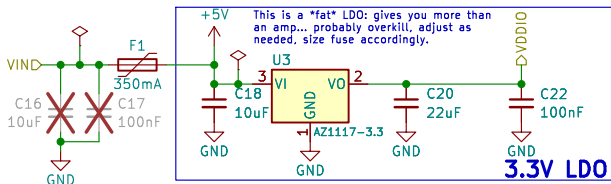
Title: Caravel Minimum Viable PCB Example

Size: A4 Date: 2023-10-25
KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Rev: 1.1
Id: 1/2

Voltage Regulators

Simple voltage regulation for logic and core. In a distinct sheet to allow you to easily do fancy stuff, like use switchers or whatever is needed.



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Sheet: /Power_Regulation/

File: power_reg.kicad_sch

Title: Voltage Regulation

Size: User Date: 2023-09-30

Rev: 1.1

KiCad E.D.A. kicad 7.0.8-7.0.8-ubuntu22.04.1

Id: 2/2

