

Rev 1.0: Initial revision

Peter Farley

Sheet: /Ethernet Interface/

File: ethernet.kicad_sch

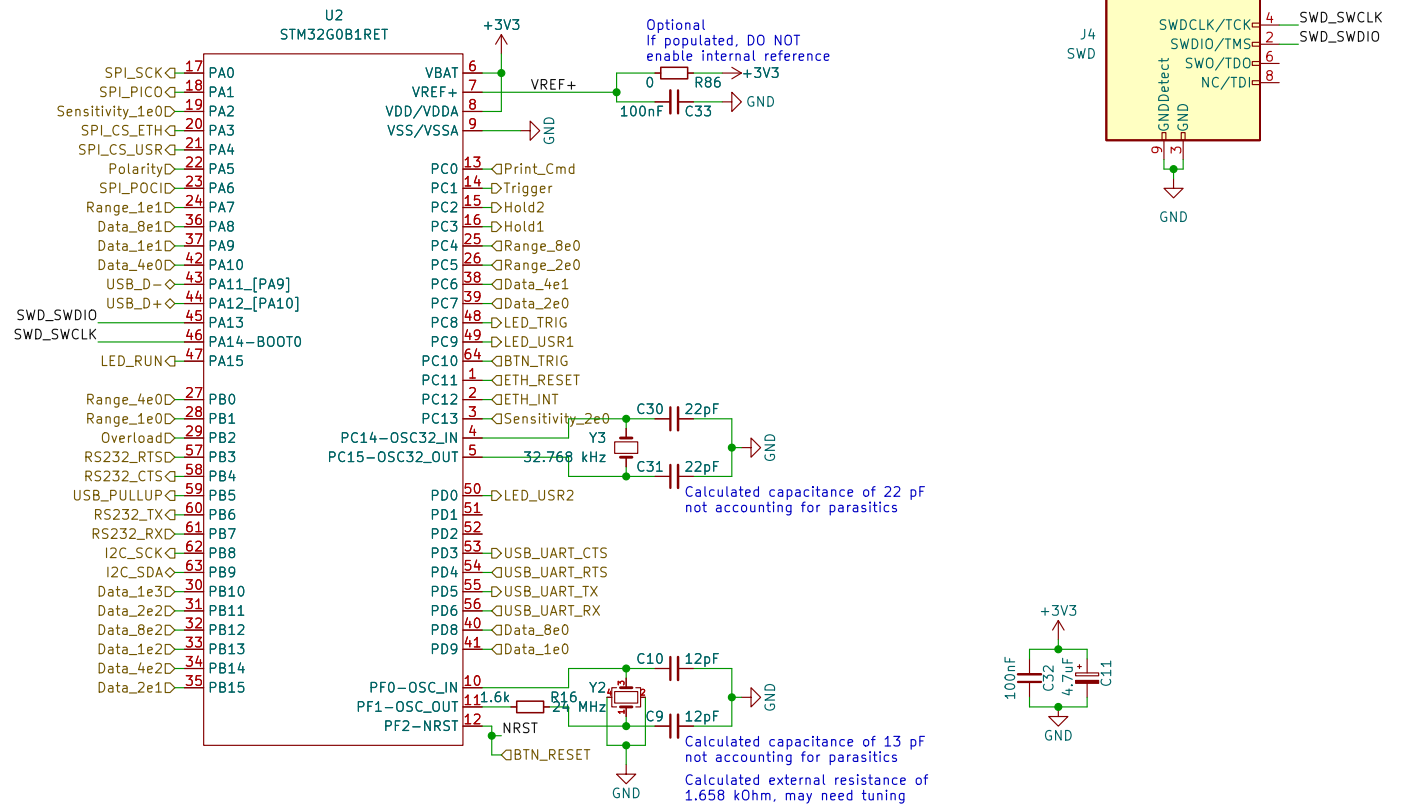
Title: Kiethley 615 Interface Board

Size: A4 Date: 2023-03-04

KiCad E.D.A. kicad (6.0.11)

Rev: 1.0

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Sheet: /MCU/

File: MCU.kicad_sch

Kitethley 615 Interface Board

Size: A4 Date: 2023-03-04

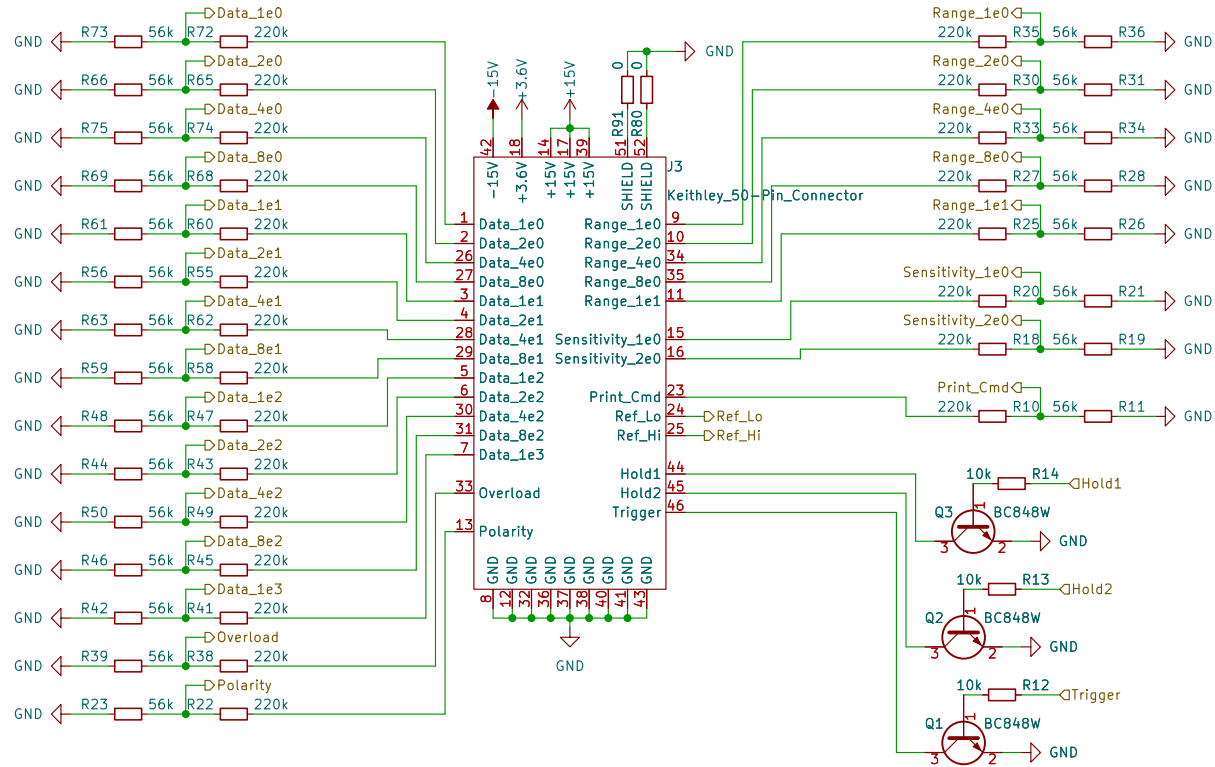
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Keithley output impedance: 0-3.9k, depending on buffer design
 MCU:
 Max input voltage: 3.3 V (some may tolerate more)
 $V_{IL}: -0.3 \cdot V_{DDIO} = 0.99 \text{ V}$
 $V_{IH}: 0.7 \cdot V_{DDIO} = 2.31 \text{ V}$

Voltage divider, w/ and w/o output impedance
 $15 \text{ V} \cdot (56k / (56k + 220k)) = 3.04 \text{ V}$
 $15 \text{ V} \cdot (56k / (56k + 220k + 3.9k)) = 3.00 \text{ V}$



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Sheet: /50pin/

File: 50pin.kicad_sch

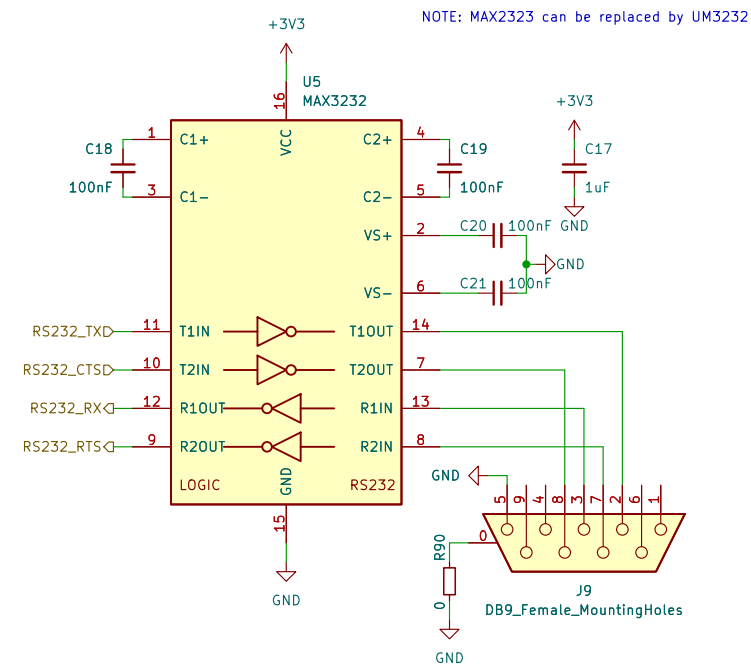
Title: Kiethley 615 Interface Board

Size: A4 Date: 2023-03-04

KiCad E.D.A. kicad (6.0.11)

Rev: 1.0

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Rev 1.0: Initial revision

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Sheet: /RS232/

File: RS232.kicad_sch

Title: Kiethley 615 Interface Board

Size: A4 Date: 2023-03-04

KiCad E.D.A. kicad (6.0.11)

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Current consumption @ 3.3 V:
MCU: 100 mA MAX
MAX232: 10 mA MAX (8 mA TYP)
FT231X: 8.4 mA MAX (8 mA TYP)
W5500: 132 mA TYP

TOTAL: 250.4 mA

Design for 500 mA

500 mA @ 3.3 V

330 mA @ 5 V

110 mA @ 12 V

Table 1. Recommended Component Selections

Output Voltage (V)	R1 (kΩ)	R2 (kΩ)	AP62250			
			L (μH)	C1 (μF)	C2 (μF)	C3 (nF)
1.2	4.99	10	1.0	10	2 x 22	100
1.5	8.66	10	1.0	10	2 x 22	100
1.8	12.4	10	1.5	10	2 x 22	100
2.5	21.5	10	1.5	10	2 x 22	100
3.3	31.6	10	2.2	10	2 x 22	100
5.0	52.3	10	2.2	10	2 x 22	100

Recommended inductor value by input voltage:

5 V: 1.3 μH

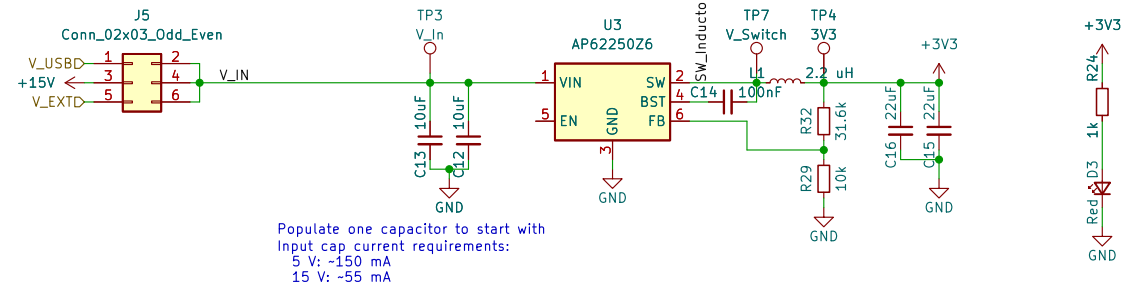
12 V: 6.7 μH

15 V: 9 μH

Inductor Current Peak: ~1 A

Current rating: >= 1.35 A

DC resistance: < 30 mΩ



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Sheet: /Power Supply/

File: PowerSupply.kicad_sch

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