PCB Connections

Raspberry Pi Connector

J1

+5V

PWR_FLAG PWR_FLAG

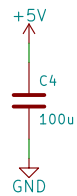| 1 | 1 | 2 | 2 |
3	3	4	4
5	5	6	6
7	7	8	8
9	9	10	10
11	11	12	12
13	13	14	14
15	15	16	16
17	17	18	18
19	19	20	20
21	21	22	22
23	23	24	24
25	25	26	26
27	27	28	28
29	29	30	30
31	31	32	32
33	33	34	34
35	35	36	36
37	37	38	38
39	39	40	40

S3_EN

AA

S1_EN
S2_EN

AB
CA
CB

1992

GND   GND
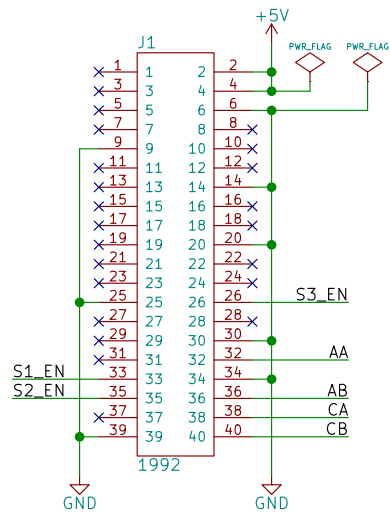
Decoupling Capacitors
place near +5V
connector pins

+5V

C1 C2 C3

0.1u 0.1u 10u

GND
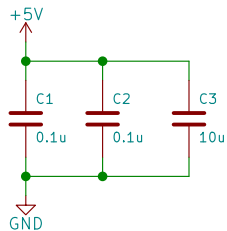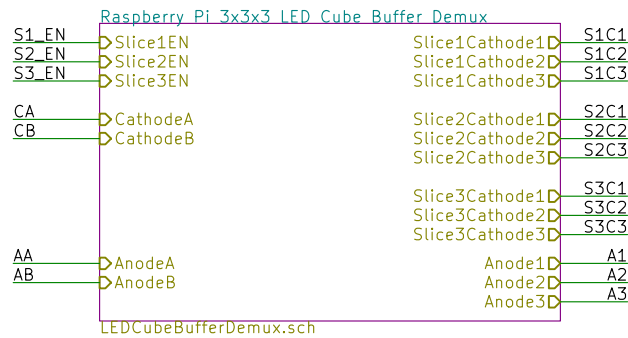
Bulk Capacitance
placement
not critical
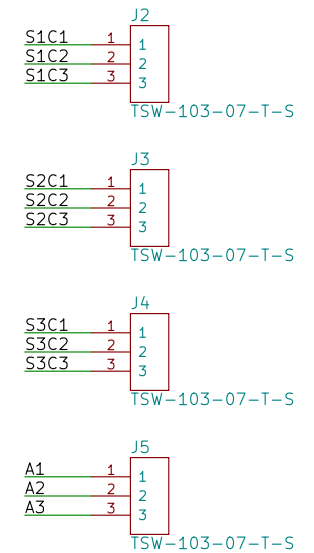
+5V

C4

100u

GND

Demux and Buffer Circuits
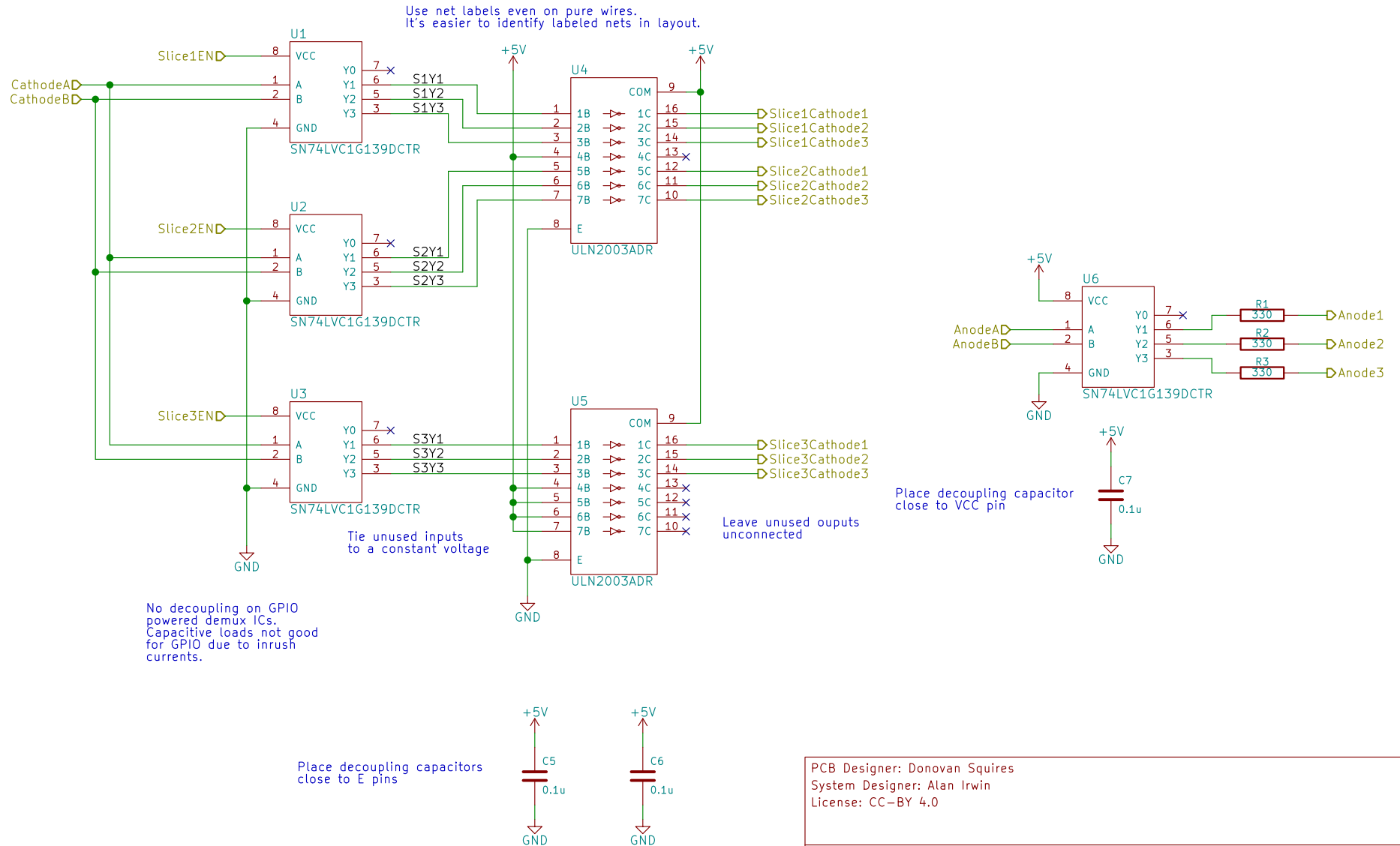
Raspberry Pi 3x3x3 LED Cube Buffer Demux

S1_EN — Slice1EN
S2_EN — Slice2EN
S3_EN — Slice3EN

CA — CathodeA
CB — CathodeB

AA — AnodeA
AB — AnodeB

Slice1Cathode1 — S1C1
Slice1Cathode2 — S1C2
Slice1Cathode3 — S1C3

Slice2Cathode1 — S2C1
Slice2Cathode2 — S2C2
Slice2Cathode3 — S2C3

Slice3Cathode1 — S3C1
Slice3Cathode2 — S3C2
Slice3Cathode3 — S3C3

Anode1 — A1
Anode2 — A2
Anode3 — A3

LEDCubeBufferDemux.sch

LED Connectors

J2

S1C1	1	1
S1C2	2	2
S1C3	3	3

TSW-103-07-T-S

J3

S2C1	1	1
S2C2	2	2
S2C3	3	3

TSW-103-07-T-S

J4

S3C1	1	1
S3C2	2	2
S3C3	3	3

TSW-103-07-T-S

J5

A1	1	1
A2	2	2
A3	3	3

TSW-103-07-T-S

Demux and Buffer Circuits

Use net labels even on pure wires.
It's easier to identify labeled nets in layout.

U1 — SN74LVC1G139DCTR
U2 — SN74LVC1G139DCTR
U3 — SN74LVC1G139DCTR
U4 — ULN2003ADR
U5 — ULN2003ADR
U6 — SN74LVC1G139DCTR

Slice1EN, Slice2EN, Slice3EN
CathodeA, CathodeB
AnodeA, AnodeB

S1Y1, S1Y2, S1Y3
S2Y1, S2Y2, S2Y3
S3Y1, S3Y2, S3Y3

Slice1Cathode1, Slice1Cathode2, Slice1Cathode3
Slice2Cathode1, Slice2Cathode2, Slice2Cathode3
Slice3Cathode1, Slice3Cathode2, Slice3Cathode3

R1 330, R2 330, R3 330
Anode1, Anode2, Anode3

C5 0.1u, C6 0.1u, C7 0.1u

No decoupling on GPIO
powered demux ICs.
Capacitive loads not good
for GPIO due to inrush
currents.

Tie unused inputs
to a constant voltage

Leave unused ouputs
unconnected

Place decoupling capacitor
close to VCC pin

Place decoupling capacitors
close to E pins