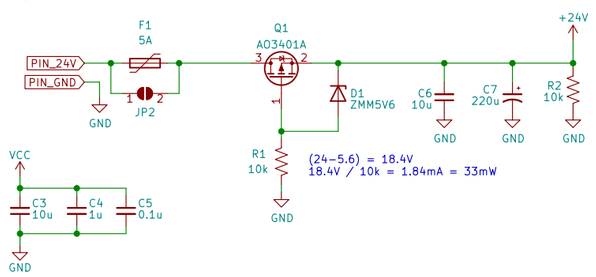
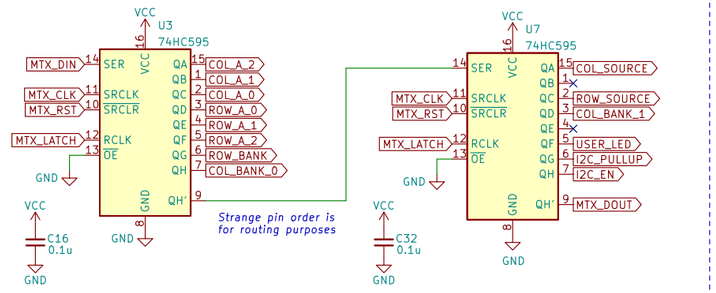
Input Power

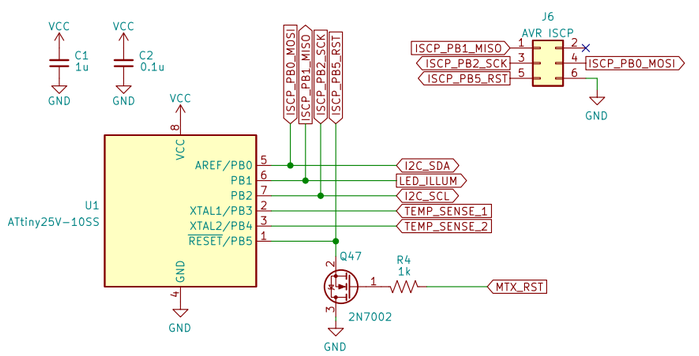
AO3401A: Vds = 30V, Vgsmax = +/- 12V
At 3A / 5.6Vgs -> Rds = 60mR -> P = 180mW



Input Shift Registers



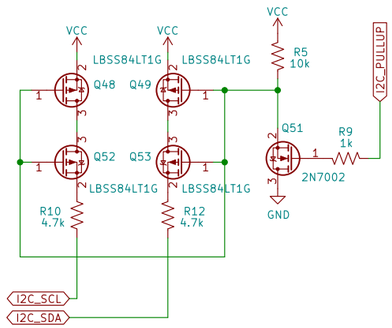
Microcontroller (PWM Generation & Temp Sense)

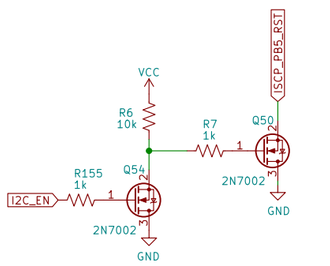


I2C Pull-ups and Reset

I2C Bus with switches to allow only
a chain of boards with one set of pullups

Simulation: i2c-disable.circuitjs.txt



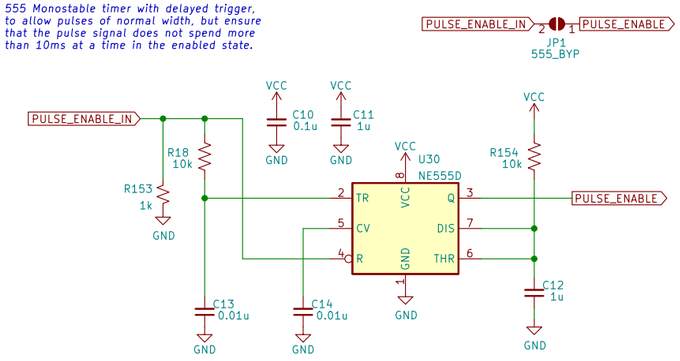


When I2C_EN is Low, pull up brings reset gate high,
which sinks the reset pin, holding the IC in reset.

When I2C_EN is High, reset gate is pulled low, which
brings the reset pin to High-Z state, releasing IC from reset.

Pulse Width Limiter

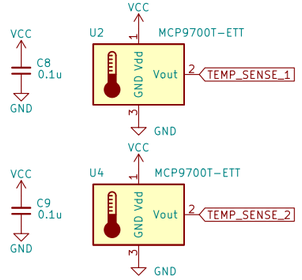
555 Monostable timer with delayed trigger,
to allow pulses of normal width, but ensure
that the pulse signal does not spend more
than 10ms at a time in the enabled state.



Simulation: pulse-watchdog.circuitjs.txt

Temperature Sensors

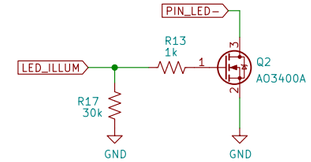
MCP9700T: Output voltage 0.1V to 1.75V
V(0c) = 0.5V, 10mV/C



Place above high power traces

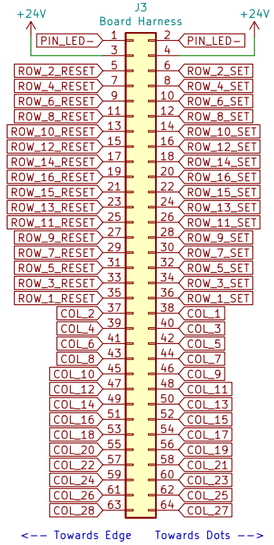
PWM Illumination Driver

LED Illuminations:
1.2A Constant Current
100% Duty Cycle

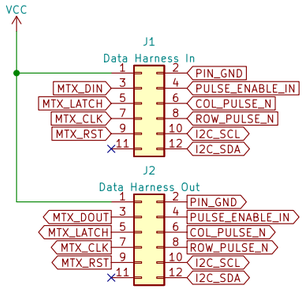


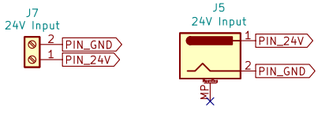
AO3004A: Vds = 30V, Id = 5.7A
Rds = 32mR -> P = 1.2 * 0.032 = 38mW

Board Harnesses

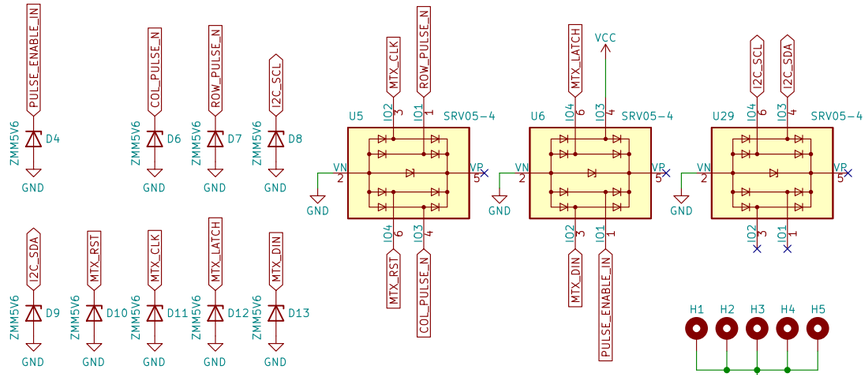


Vcc Min 3V, Max 5.5V

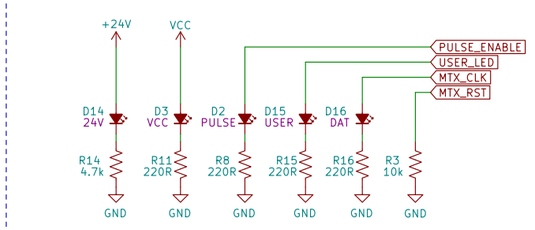




Circuit Protection, Test Points



LED Indicators



24V/Vcc - Yellow (Vf=2)
- 4.6mA for 24V at 4.7k
- 13.6mA for Vcc=5V, 5.9mA for Vcc=3.3V
PULSE/DAT - Green (Vf=3.3)
- 7.7mA for Vcc=5V, <1mA for Vcc=3.3V
USER - Blue (Vf=2.8)
- 10mA for Vcc=5V, 2.2mA for Vcc=3.3V

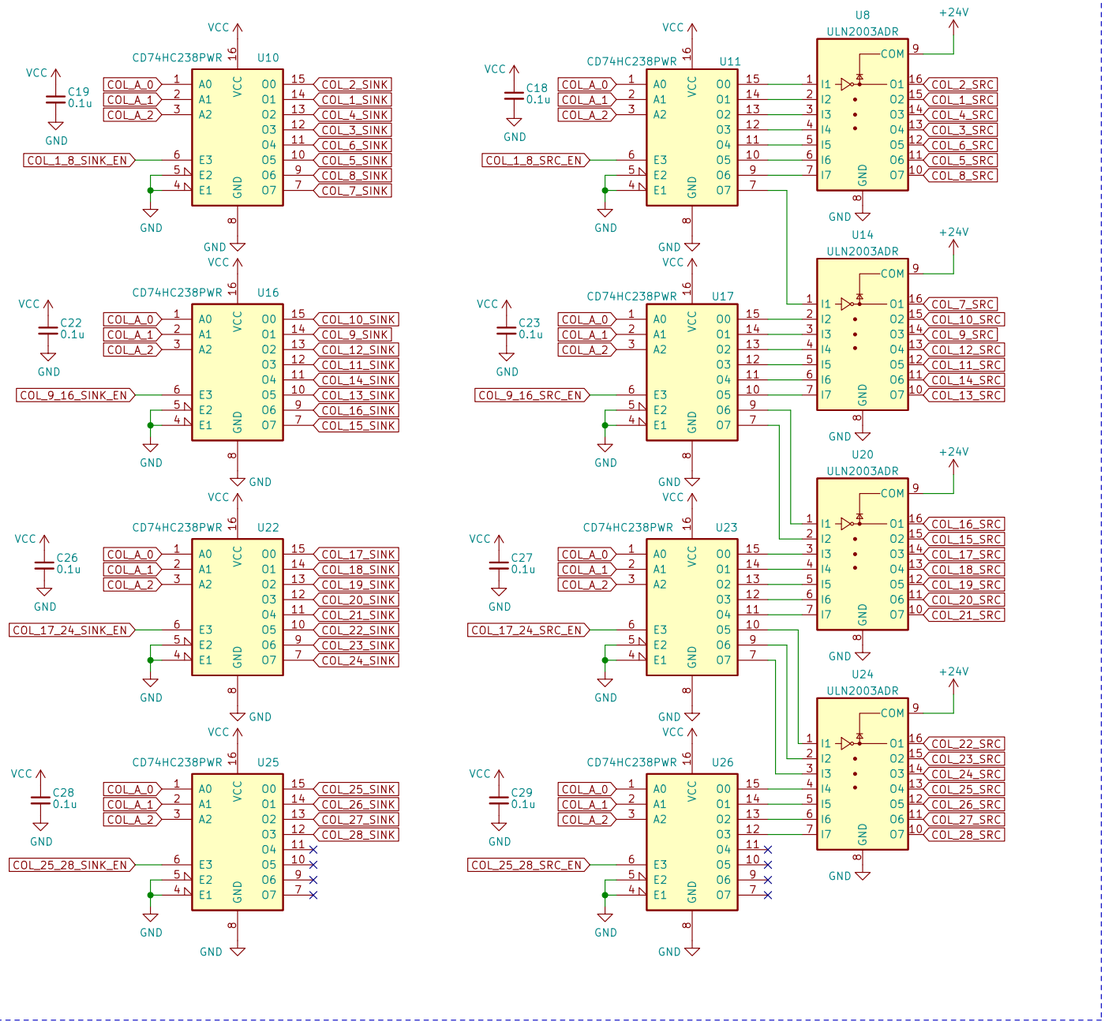
Decoders — File: Decoders.kicad_sch
Column Drivers — File: ColumnDriver.kicad_sch
Row Drivers — File: RowDriver.kicad_sch

Sheet: /
File: FlippyDriver.kicad_sch

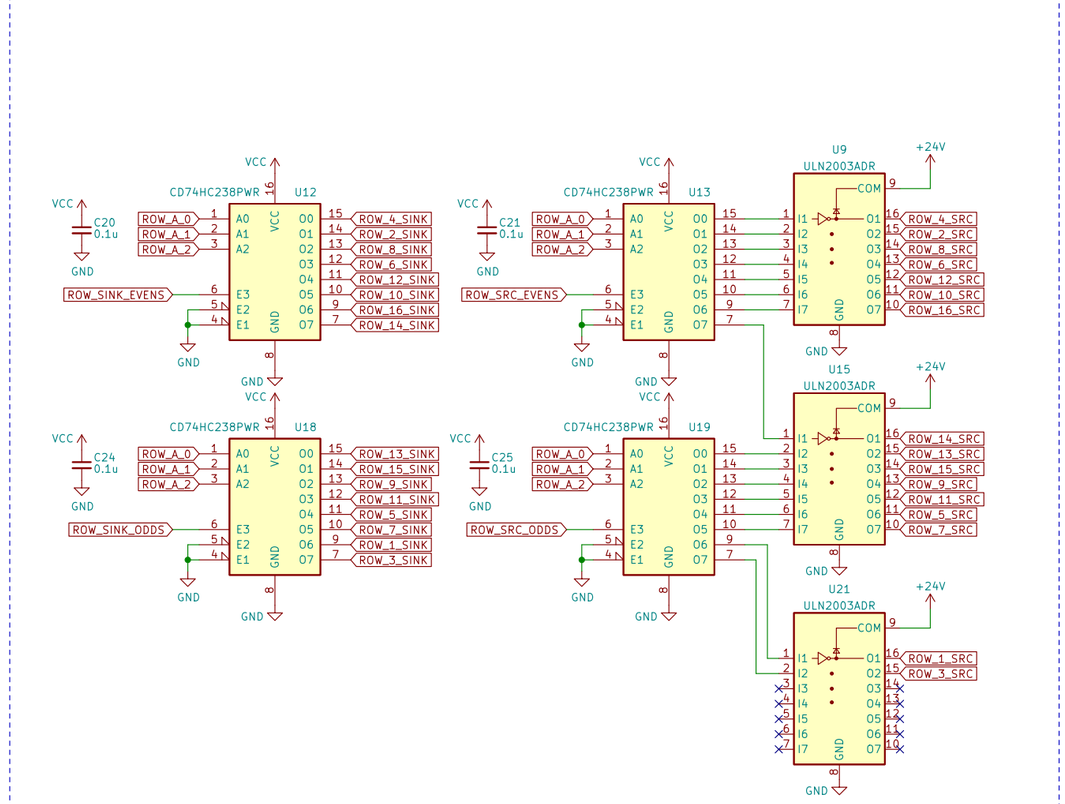
Title: Luminator MAX3000 Custom Driver Board

Size: USLedger	Date: 2022-08-13	Rev: C
KiCad E.D.A. kicad (6.0.0-0)		Id: 1/4

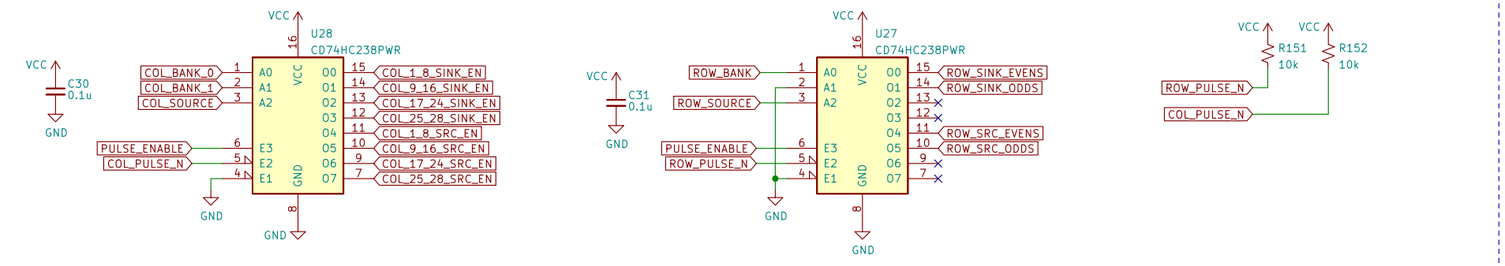
Column Banks



Row Banks



Bank Decoders



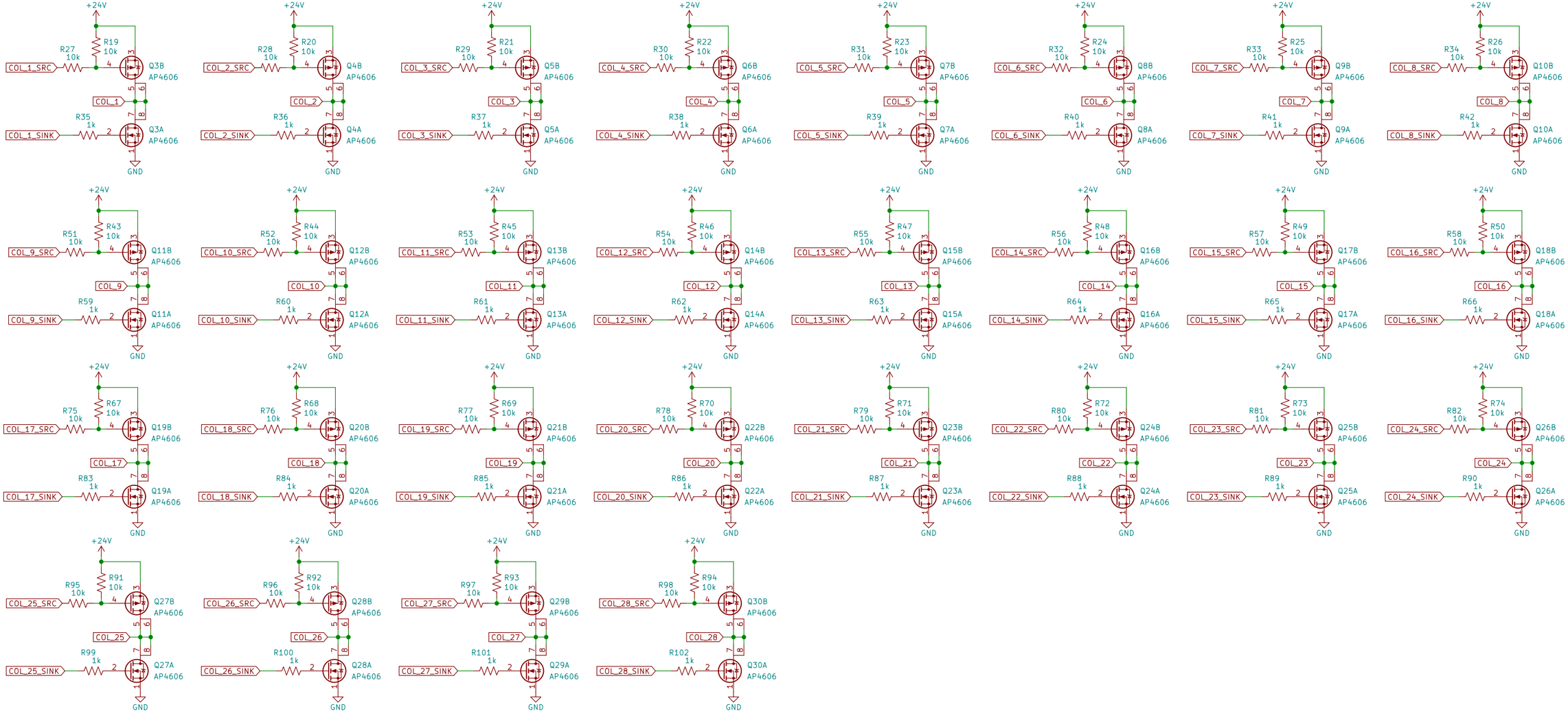
Order of Sink/Source lines is done to make routing cleaner

WARNING: Sink MUST be turned off before Source!
To RESET, current flows from COL to ROW_RESET
To SET, current flows from ROW_SET to COL

Sheet: /Decoders/
File: Decoders.kicad_sch

Title: Luminator MAX3000 Custom Driver Board

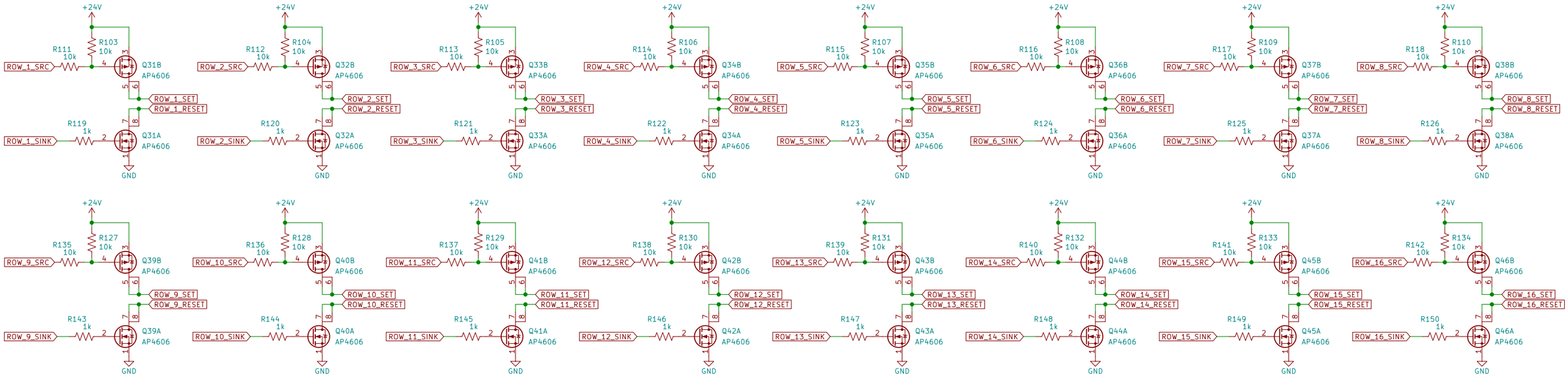
Size: USLedger	Date: 2022-08-16	**Rev: C**
KiCad E.D.A. kicad (6.0.0-0)		Id: 2/4



Sheet: /Column Drivers/
File: ColumnDriver.kicad_sch

Title: Luminator MAX3000 Custom Driver Board

Size: USLedger	Date: 2022-08-16	**Rev: C**
KiCad E.D.A. kicad (6.0.0-0)		Id: 3/4



Sheet: /Row Drivers/
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Title: Luminator MAX3000 Custom Driver Board

Size: USLedger	Date: 2022-07-31	**Rev: C**
KiCad E.D.A. kicad (6.0.0-0)		Id: 8/4