

Sheet: M9302

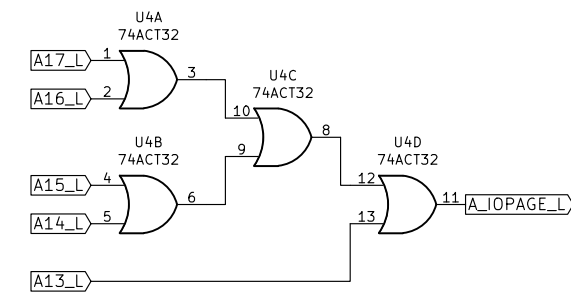
Sheet: LEDs

Sheet: LA

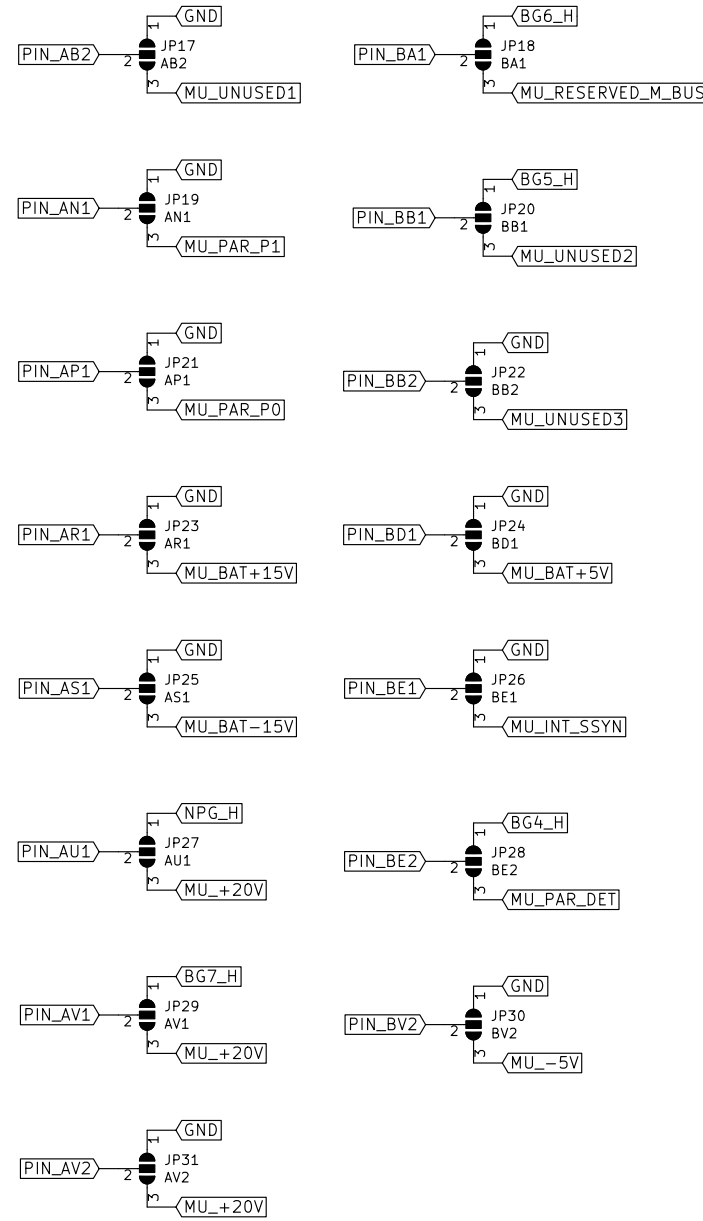
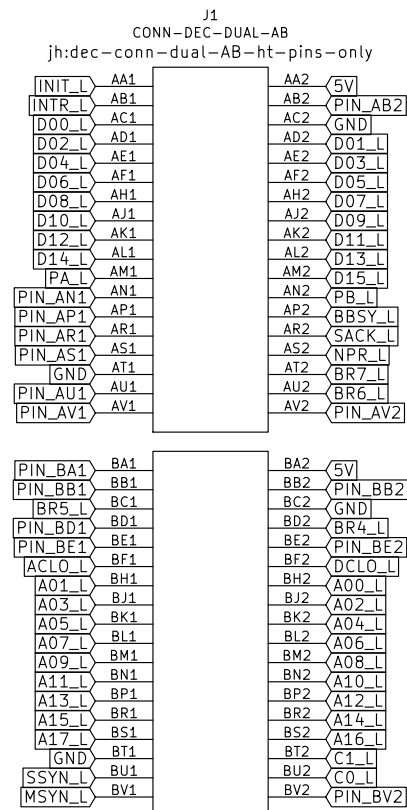
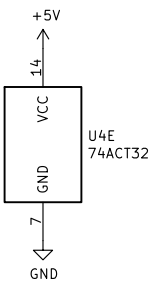
File: M9302.sch

File: LEDs.sch

File: LA.sch



IOPAGE\_L <=> A<17:13> all Low active  
3x 4.5ns < 15ns max delay



Memory interface  
on Modified Unibus  
not used

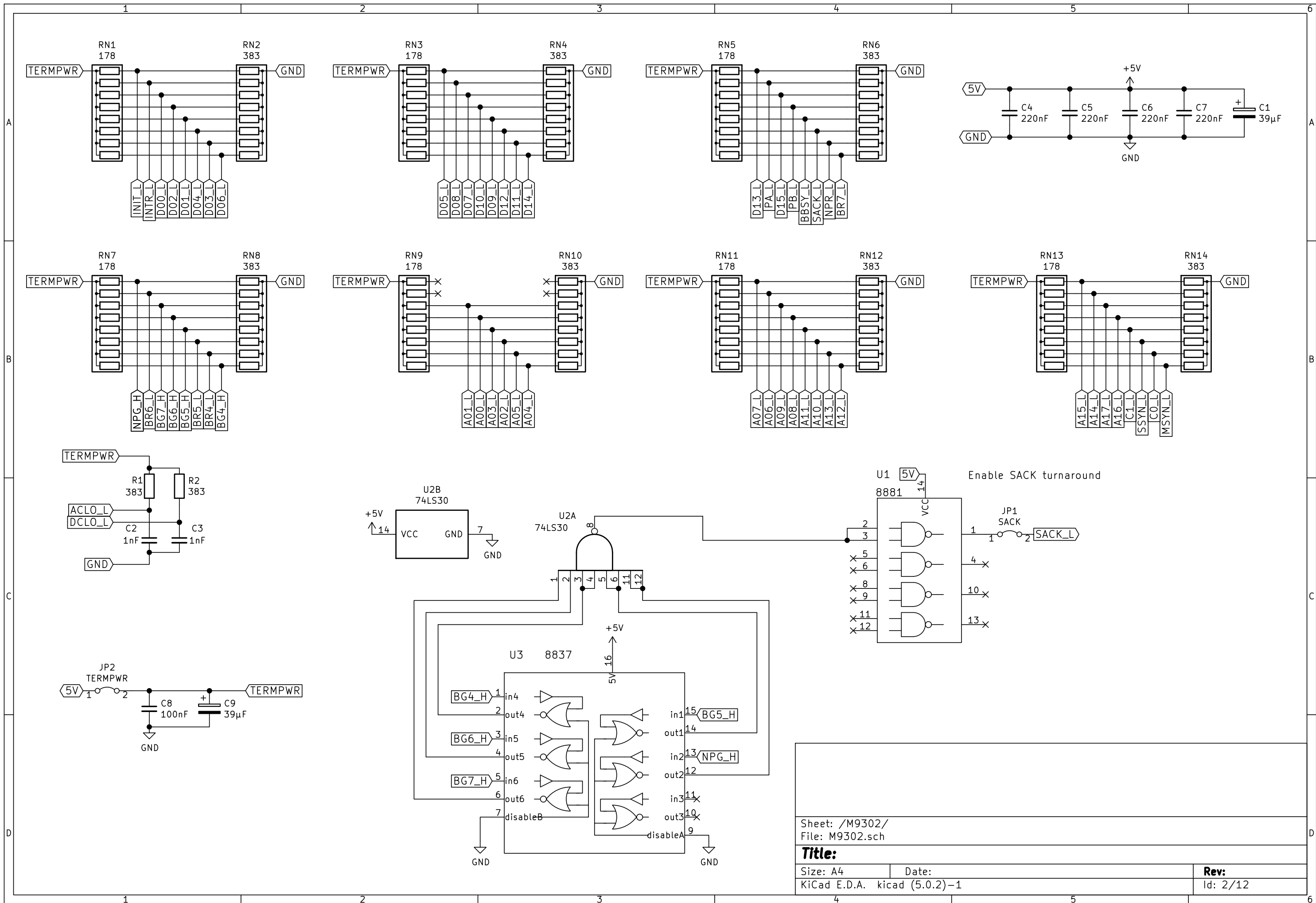
- × MU\_UNUSED1
- × MU\_RESERVED\_M\_BUS
- × MU\_UNUSED2
- × MU\_UNUSED3
- × MU\_PAR\_P1
- × MU\_PAR\_P0
- × MU\_PAR\_DET
- × MU\_INT\_SSYN

"Modified UNIBUS" see DD11-D\_RevC\_Engineering\_Drawings\_Feb77.pdf. wire list

Jumper 1-2: Std UNIBUS slot  
Jumper 2-3: Modified UNIBUS slots  
no BG4,5,6,7,NPG, less GND

When MUD configuration:  
- all Jumpers open or 2-3  
ELSE +/-20V on certain AL probes!!!  
- do not populated terminator resistors  
(or use high ohm 50:50, then open wires will light LEDs with 50% intensity  
- disable SACK turnaround

MU-probe can be put in raw A-B of std SPC slots without rejumping backplanes.  
MU-probe shows several voltages on front pin header.



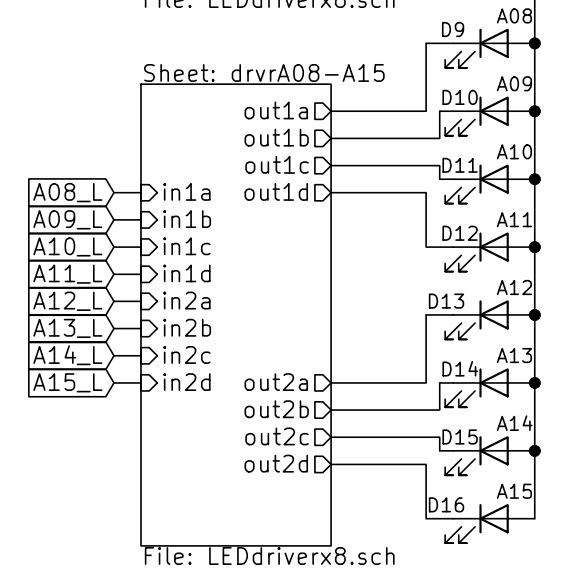
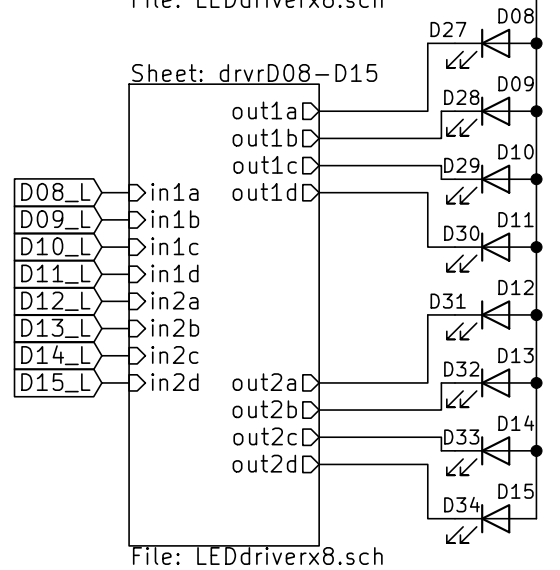
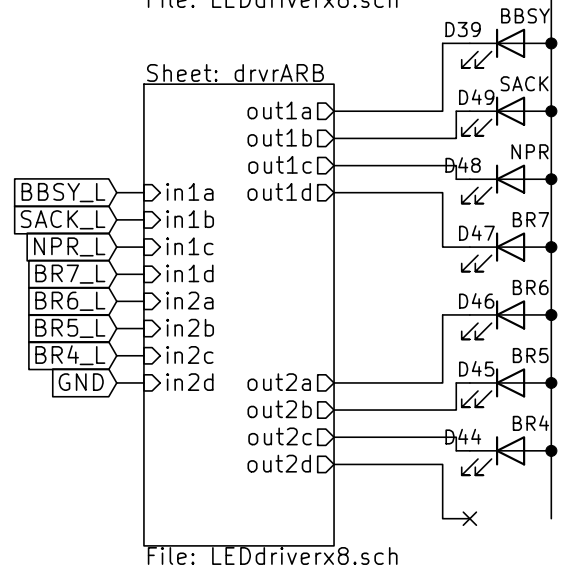
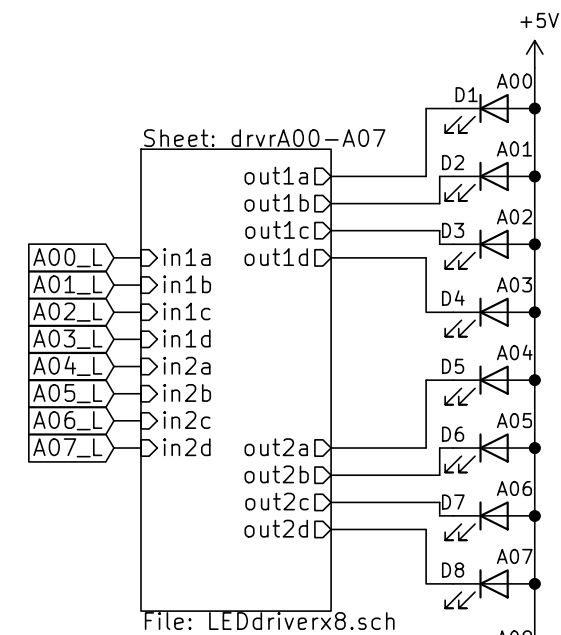
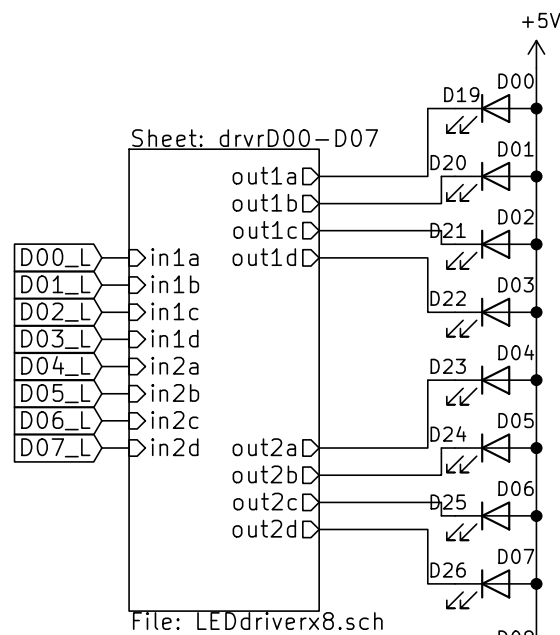
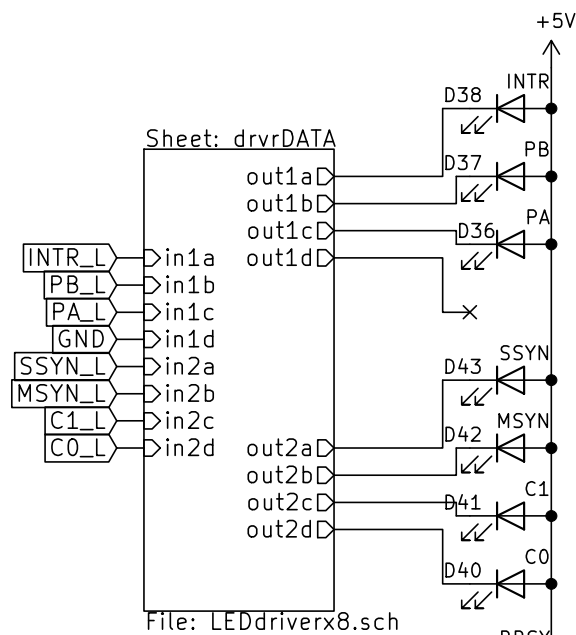
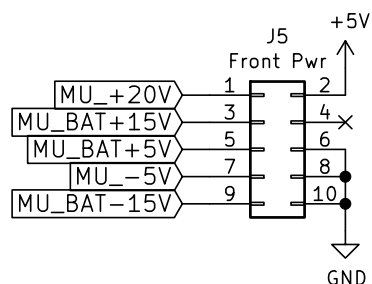
Sheet: /M9302/  
File: M9302.sch

**Title:**

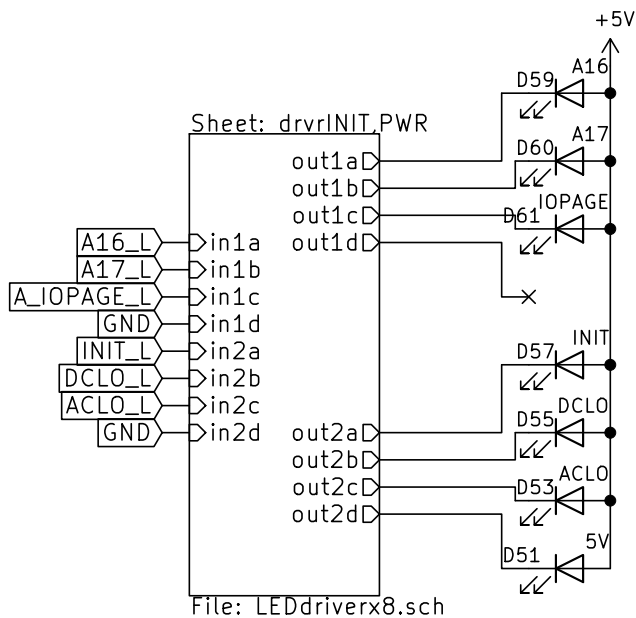
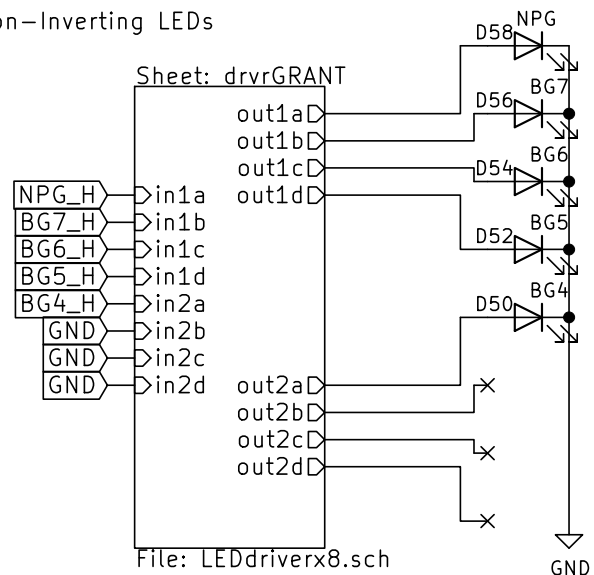
Size: A4 Date: \_\_\_\_\_  
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**Rev:**  
Id: 2/12

Front Power header:  
 MU-probe: populate 2x05  
 Std-probe: populate 2,4,6,8,10



Non-Inverting LEDs



Sheet: /LEDs/  
 File: LEDs.sch

**Title:**

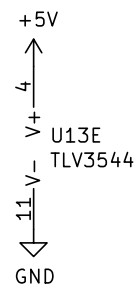
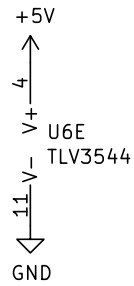
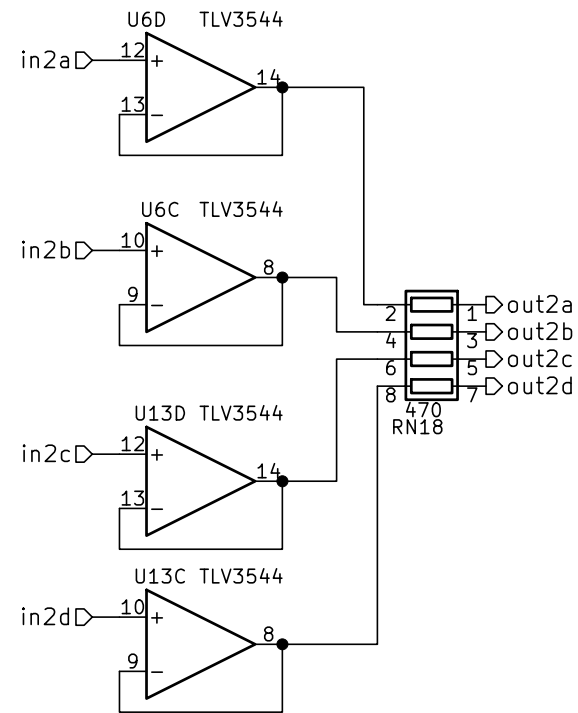
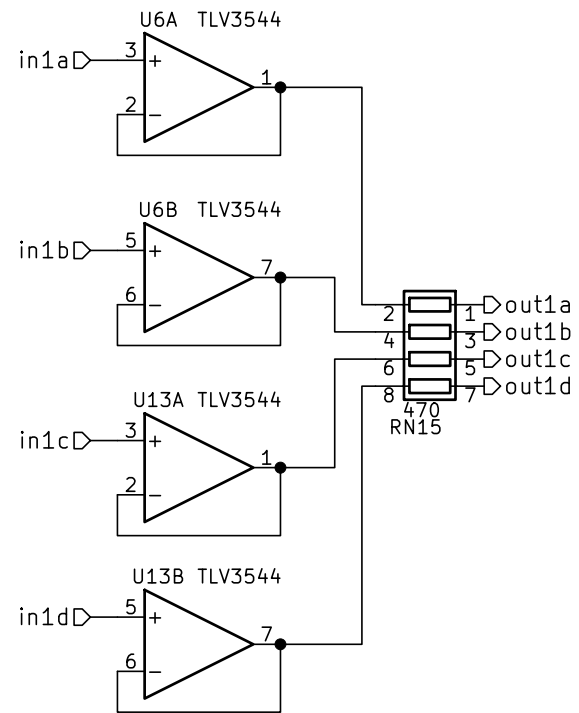
Size: A4 Date:  
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**Rev:**  
 Id: 3/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrA00-A07/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

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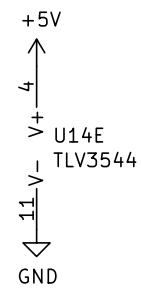
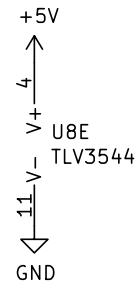
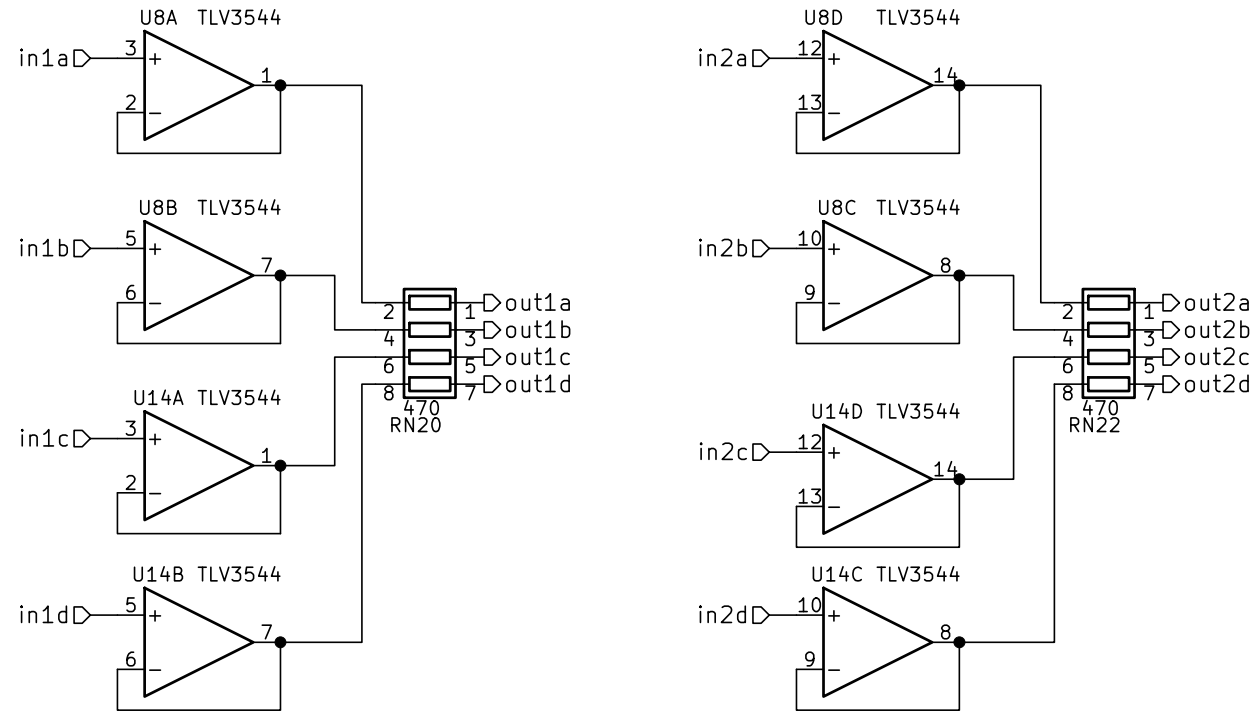
**Rev:**

Id: 4/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrA08-A15/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

KiCad E.D.A. kicad (5.0.2)-1

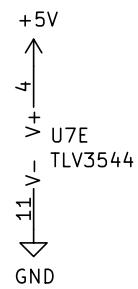
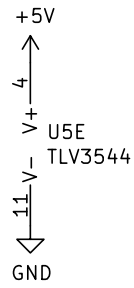
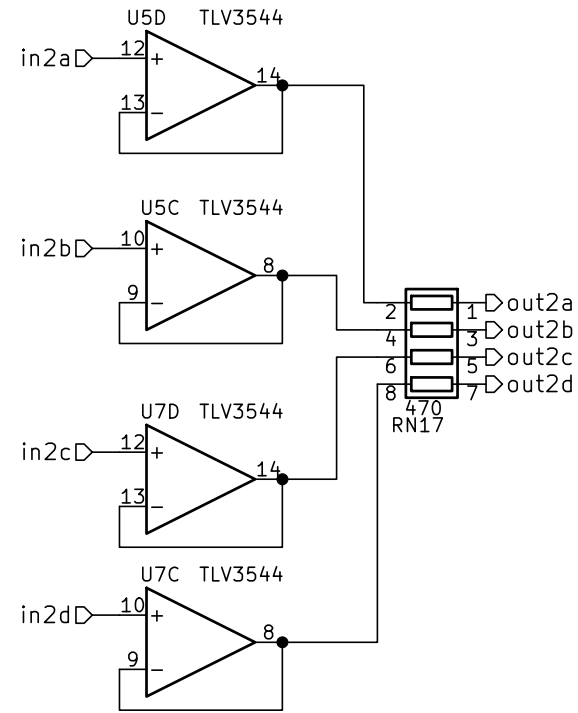
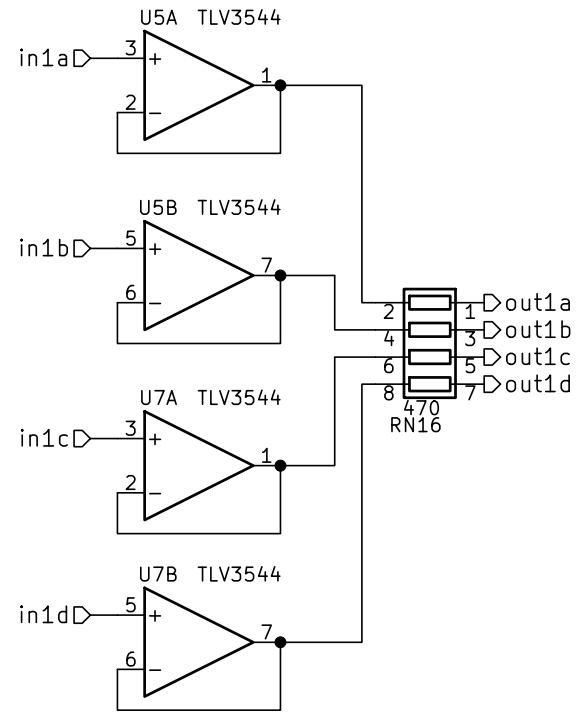
**Rev:**

Id: 5/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrD00-D07/  
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**Title:**

Size: A4

Date:

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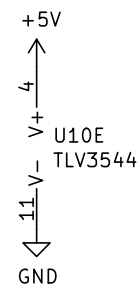
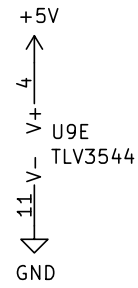
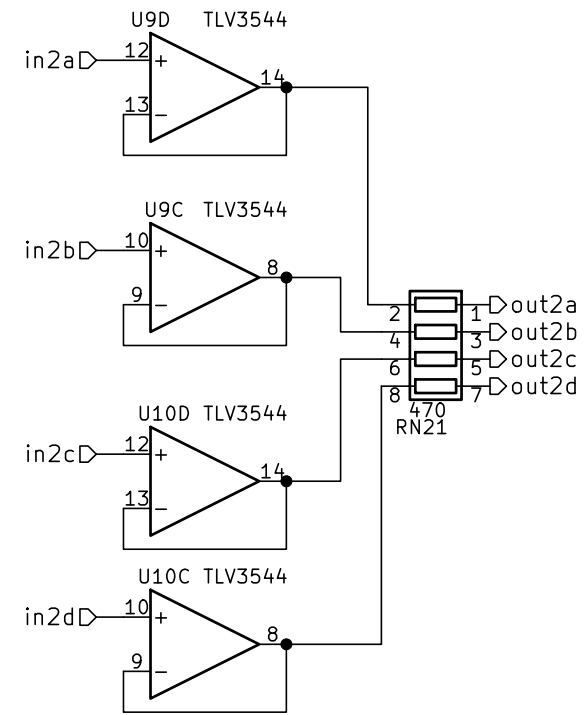
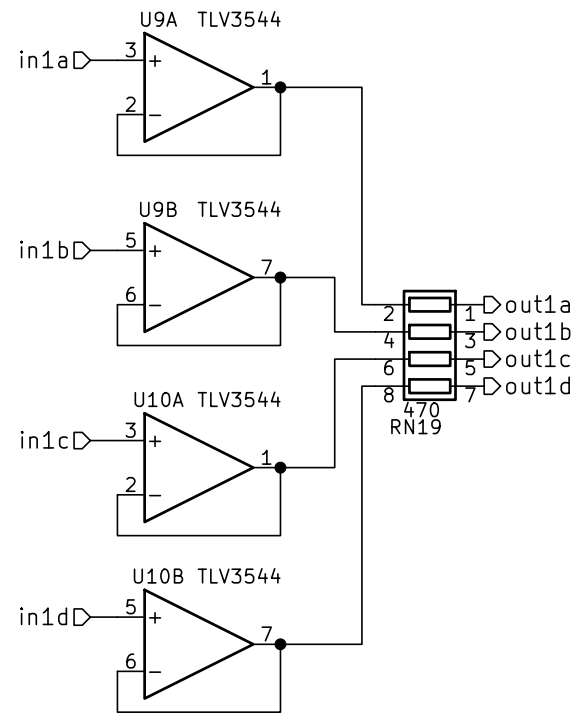
**Rev:**

Id: 6/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrD08-D15/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

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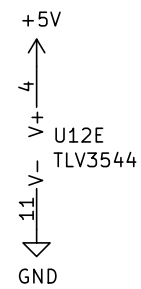
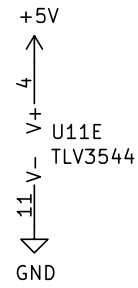
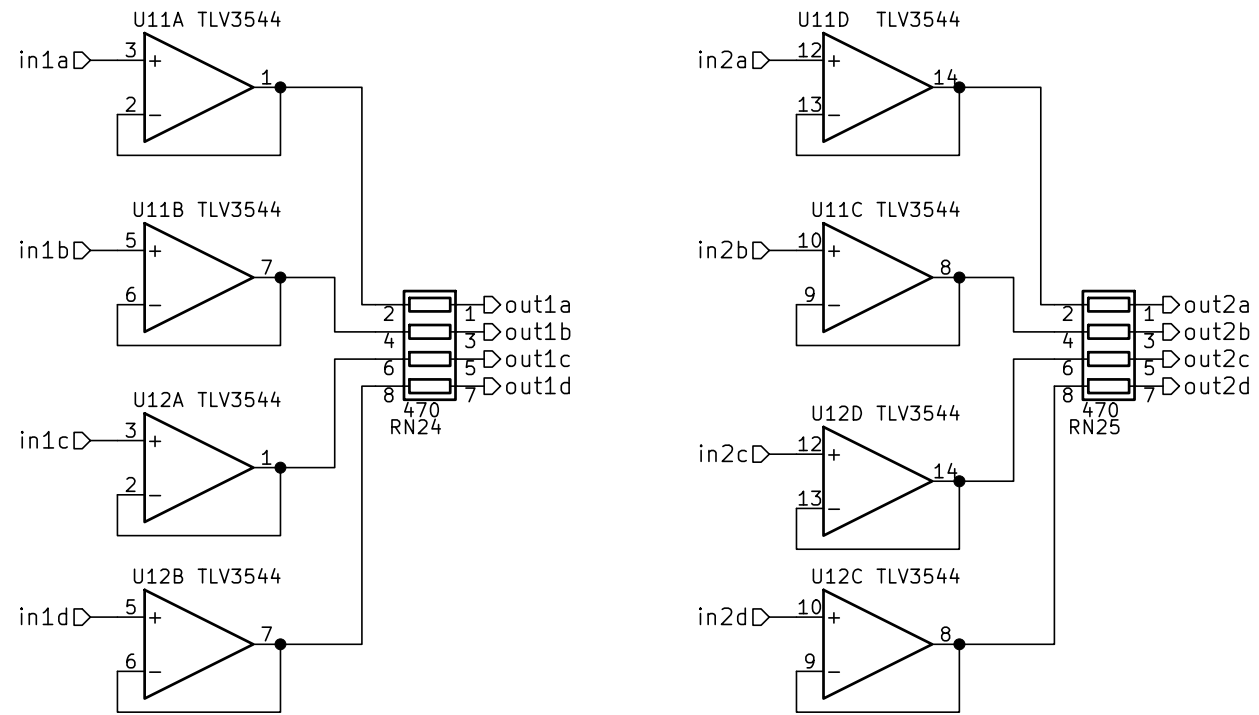
**Rev:**

Id: 7/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvr/INIT,PWR/  
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**Title:**

Size: A4

Date:

KiCad E.D.A. kicad (5.0.2)-1

**Rev:**

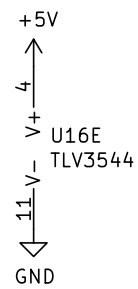
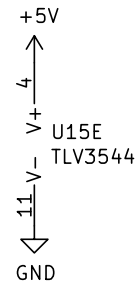
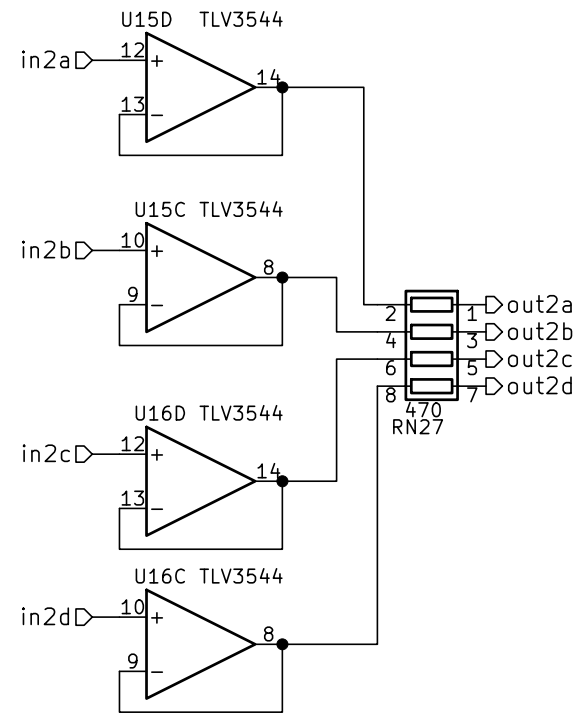
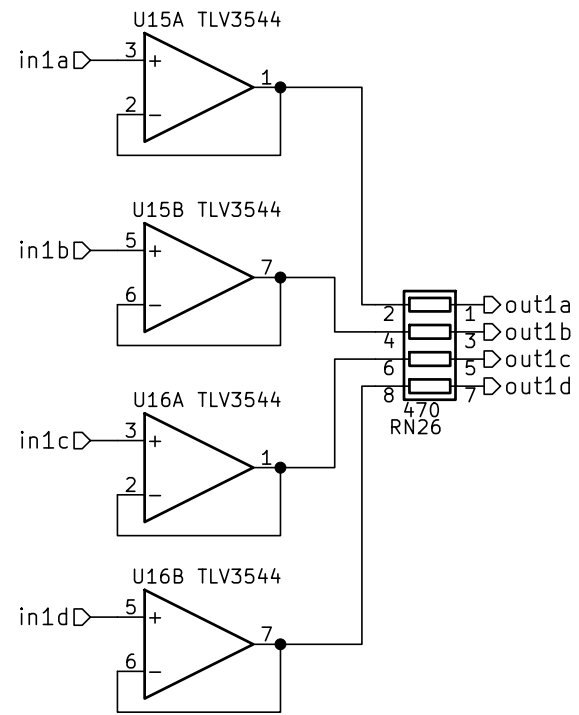
Id: 8/12



Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrDATA/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

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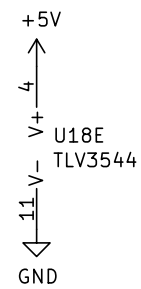
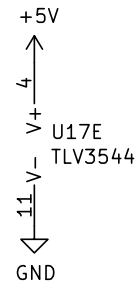
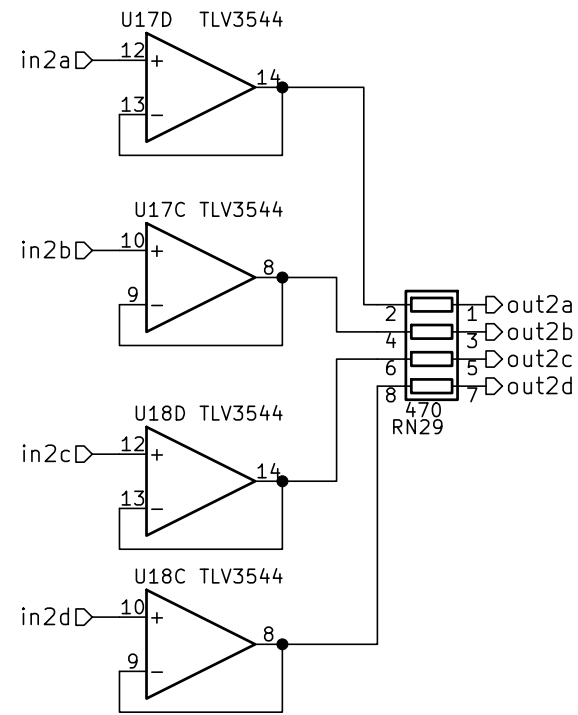
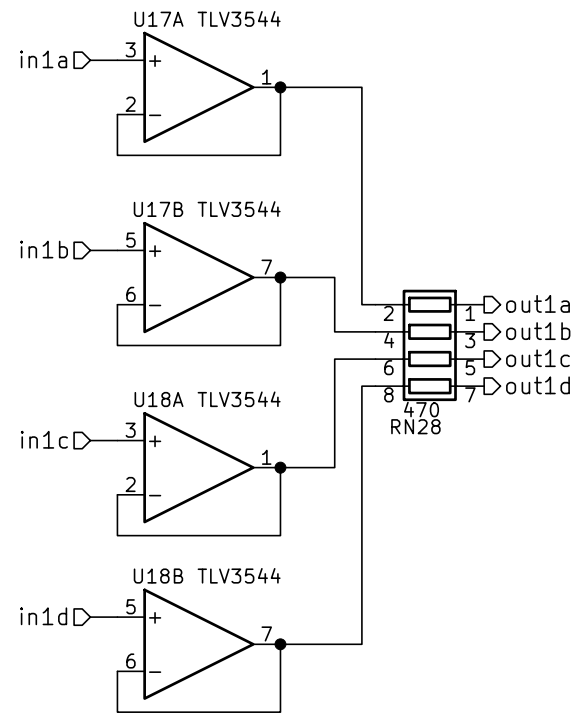
**Rev:**

Id: 9/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrARB/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

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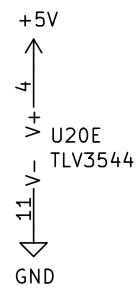
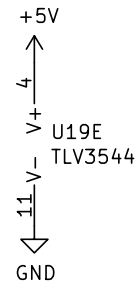
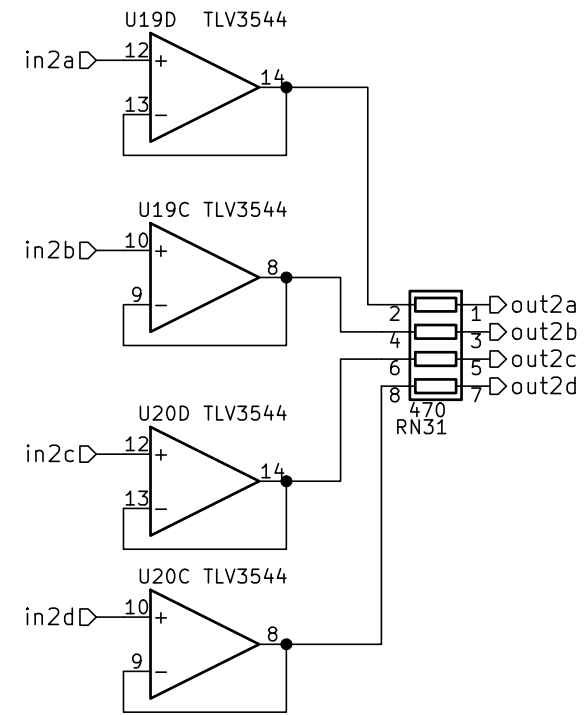
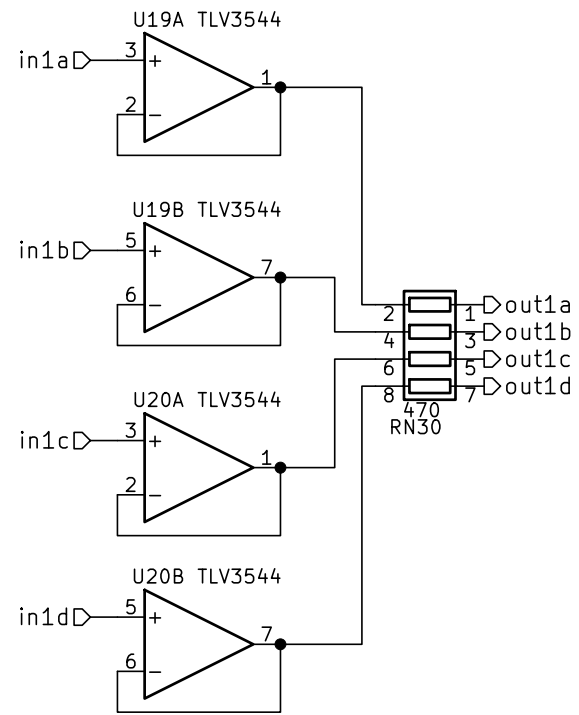
**Rev:**

Id: 10/12

Analog LED driver for 8 bus lines.  
LED driven by 0..5V.

Footprint on PCB:

out1a	in1a	in2a	out2a
out1b	in1b	in2b	out2b
out1c	in1c	in2c	out2c
out1d	in1d	in2d	out2d



Sheet: /LEDs/drvrGRANT/  
File: LEDdriverx8.sch

**Title:**

Size: A4

Date:

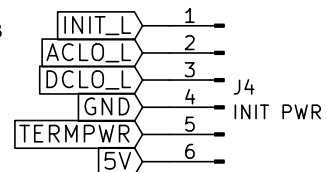
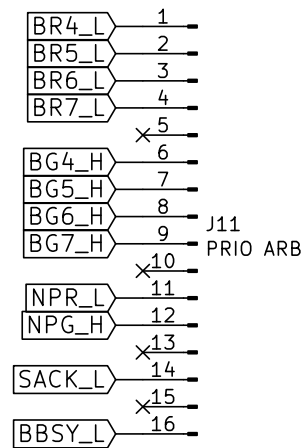
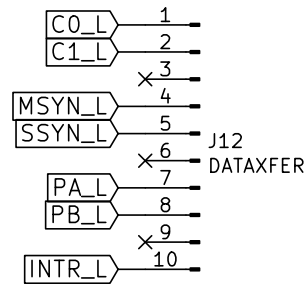
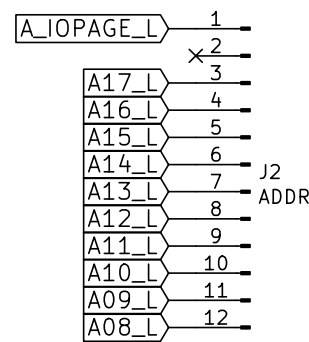
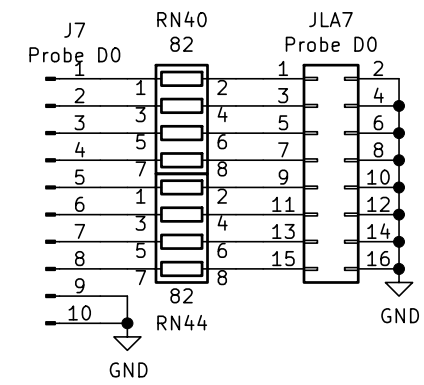
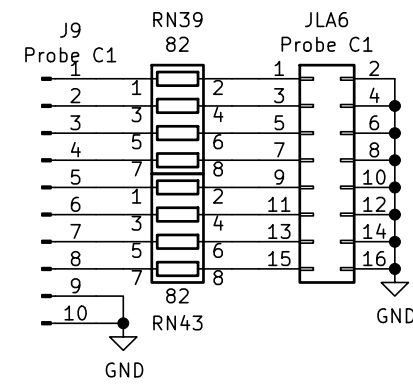
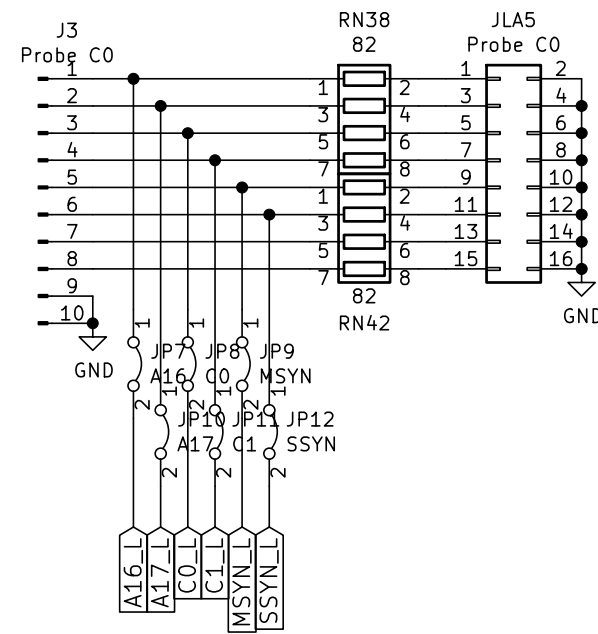
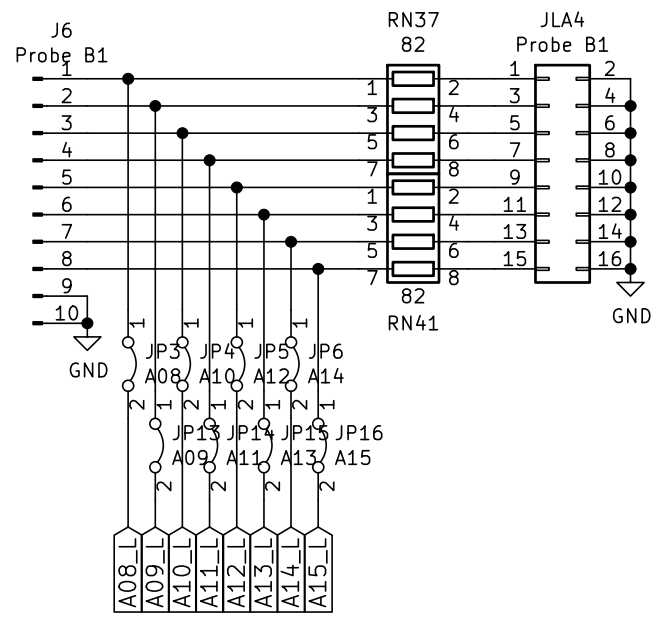
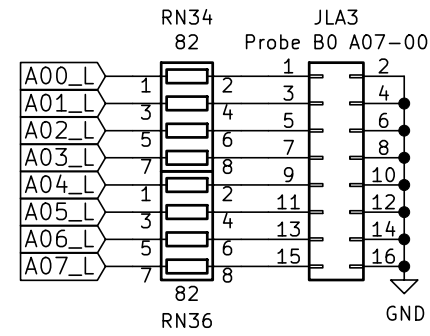
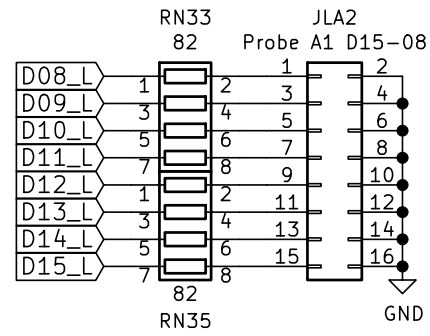
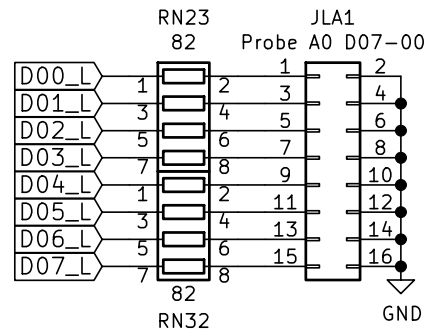
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**Rev:**

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Inline terminators before LA probes  
inhibit signal reflection & bounce.  
82 ohm for 50cm Zeroplus flat cable

LA Probes  
A0: fix UNIBUS D07:00  
A1: fix UNIBUS D15:08  
B0: fix UB A07:00  
B1: pluggable, jumpers to A15:A08  
C0: pluggable, jumpers to SSYN,MSYN;C1,CO,A17,A16  
C1: pluggable  
D0: pluggable  
D1:pluggable



Sheet: /LA/  
File: LA.sch

**Title:**

Size: A4 Date:  
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**Rev:**  
Id: 12/12