

MANUFACTURER: SCDDesign,LLC
PO Box 924, Roseland, FL 32957

PROJECT: mdb-lightKit

All variants other than mdb-measureKit

Supply Voltage: 5VDC
Supply Current: 3.5A
Max Load: 3.5A

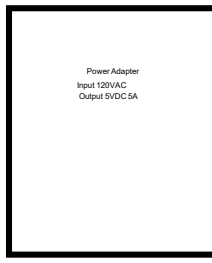
mdb-measureKit Variant

Supply Voltage: 12VDC
Supply Current: 8A
Max Load: 5.5A
OC Protection Stepper Motors: 1A per axis

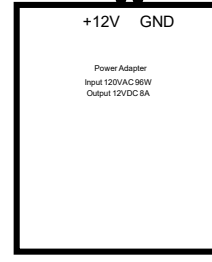
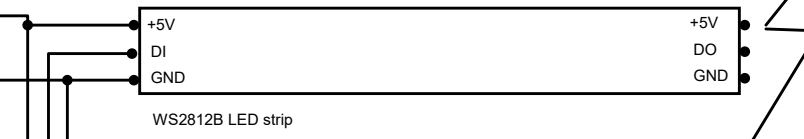
Person Responsible for Project: MBuxton

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Sheet Title: Title Page	
BY: M. Buxton	REV: A

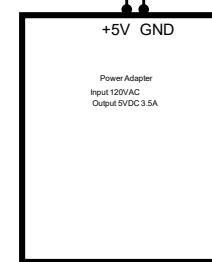
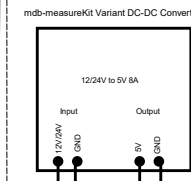
LED Strip Power Supply



Optional LED Visual Feedback



Controller Power Supply



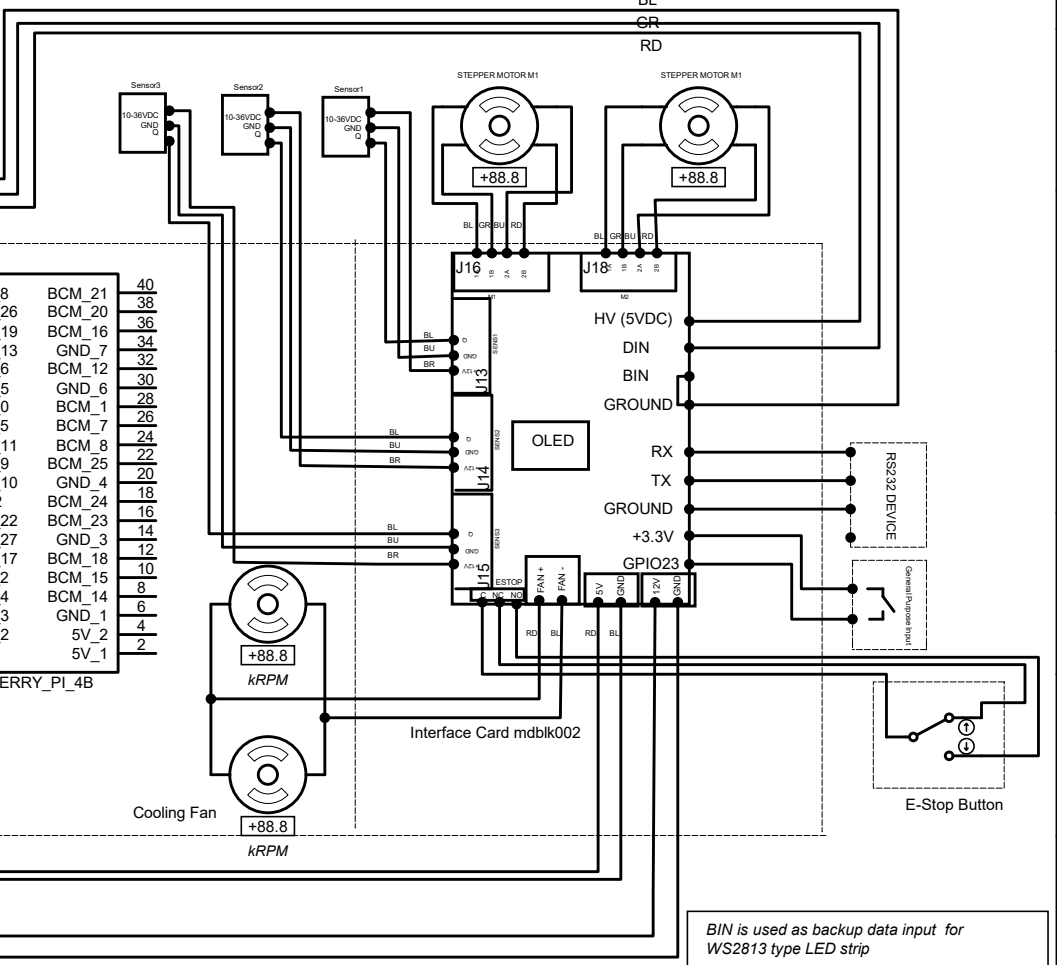
Controller Power Supply

U3

39	GND_8	BCM_21	40
37	BCM_26	BCM_20	38
35	BCM_19	BCM_16	36
33	BCM_13	GND_7	34
31	BCM_6	BCM_12	32
29	BCM_5	GND_6	30
27	BCM_0	BCM_1	28
25	GND_5	BCM_7	26
23	BCM_11	BCM_8	24
21	BCM_9	BCM_25	22
19	BCM_10	GND_4	20
17	3V3_2	BCM_24	18
15	BCM_22	BCM_23	16
13	BCM_27	GND_3	14
11	BCM_17	BCM_18	12
9	GND_2	BCM_15	10
7	BCM_4	BCM_14	8
5	BCM_3	GND_1	6
3	BCM_2	5V_2	4
1	3V3_1	5V_1	2

RASPBERRY_PI_4B

RPI4B ASSY

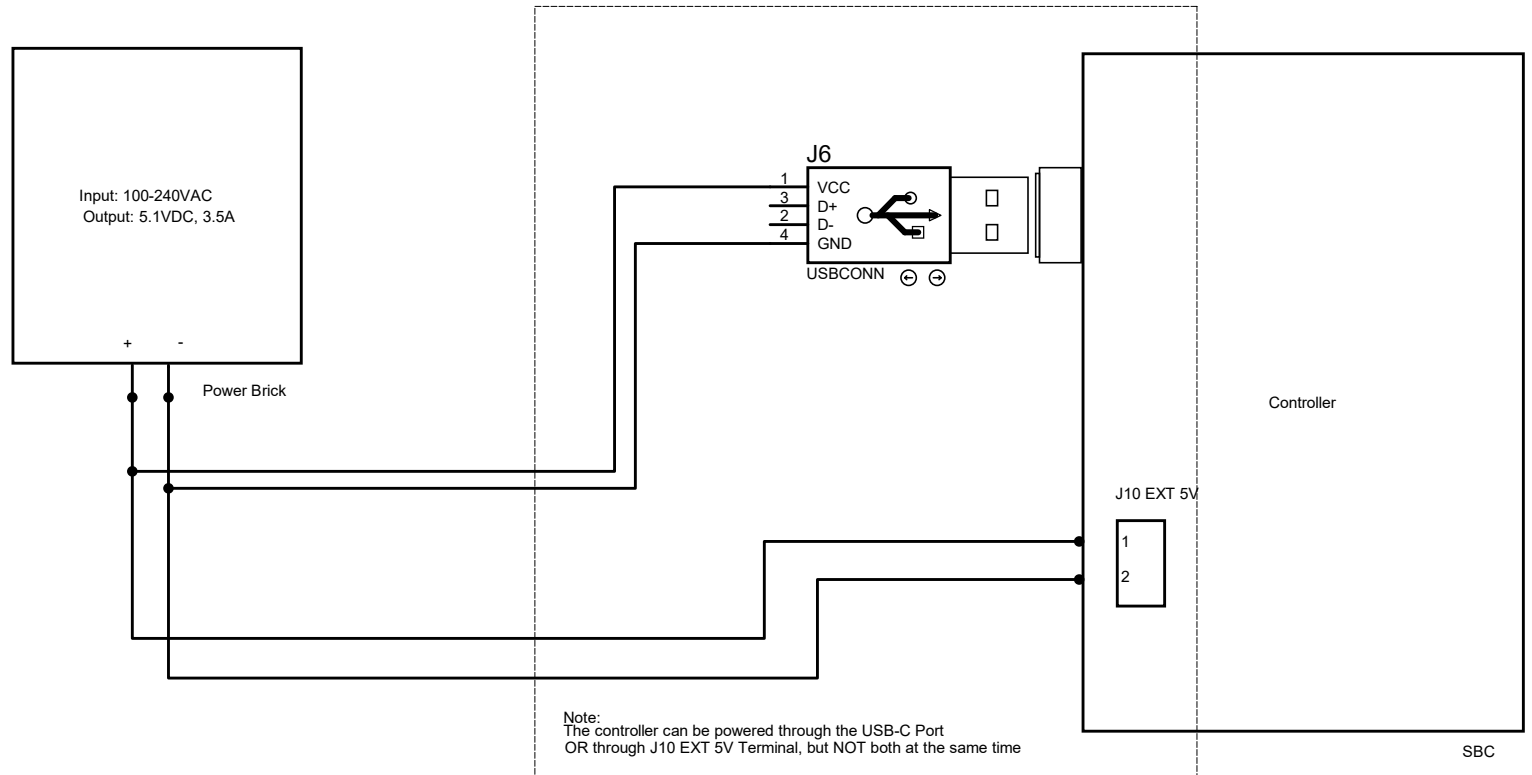


Note:
 When the controller is configured as mdb-measureKit, the 12VDC output power supply is used
 When the controller is configured as other variants, the 5VDC output power supply is used

BIN is used as backup data input for WS2813 type LED strip

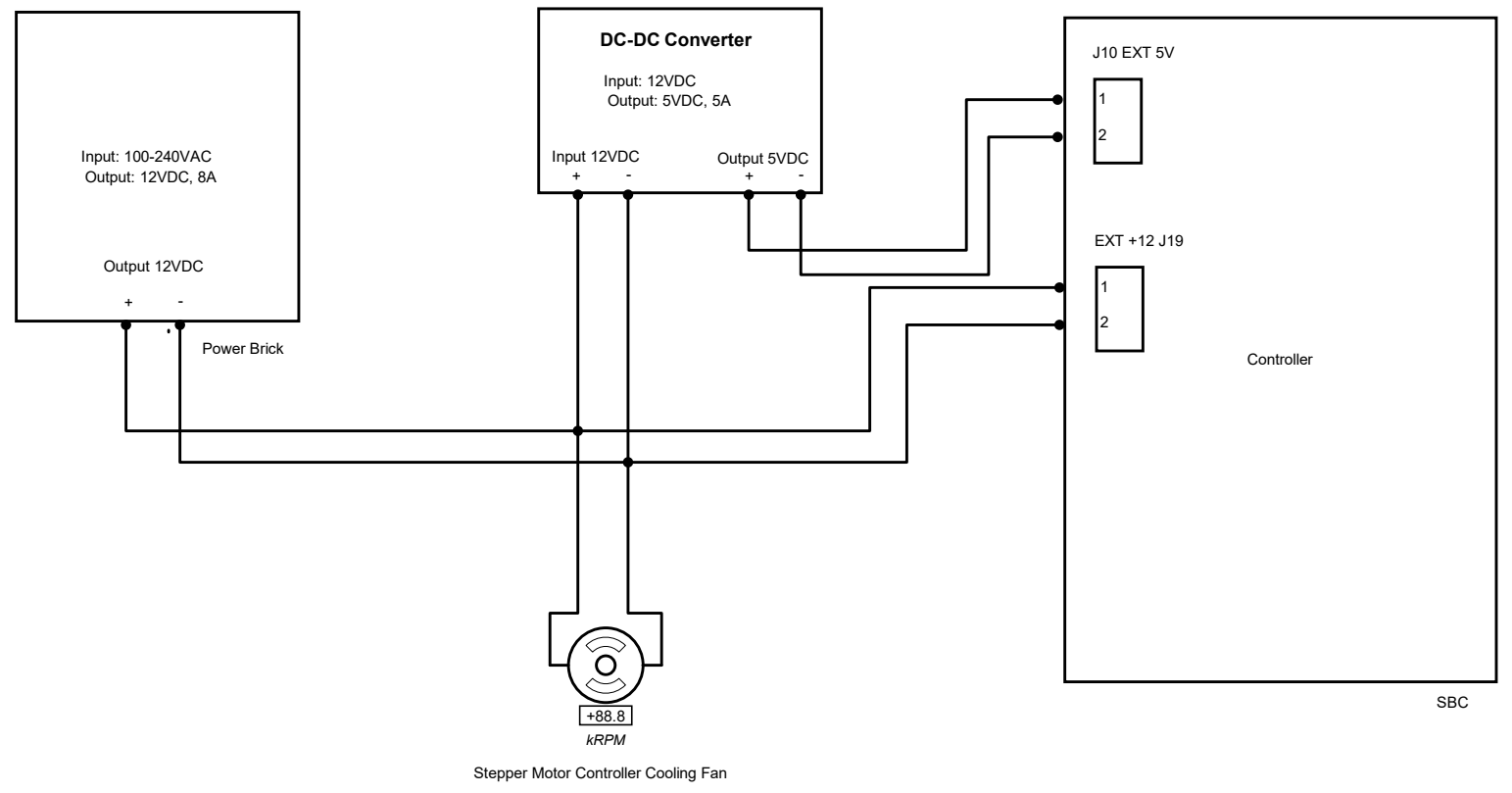
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Sheet Title: Inter-Connection Overview	BY: M. Buxton
REV: A	

All variants other than mdb-measureKit



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Sheet Title: Power, Standard Variance	PAGE: 3 of 15
BY: M. Buxton	REV: A

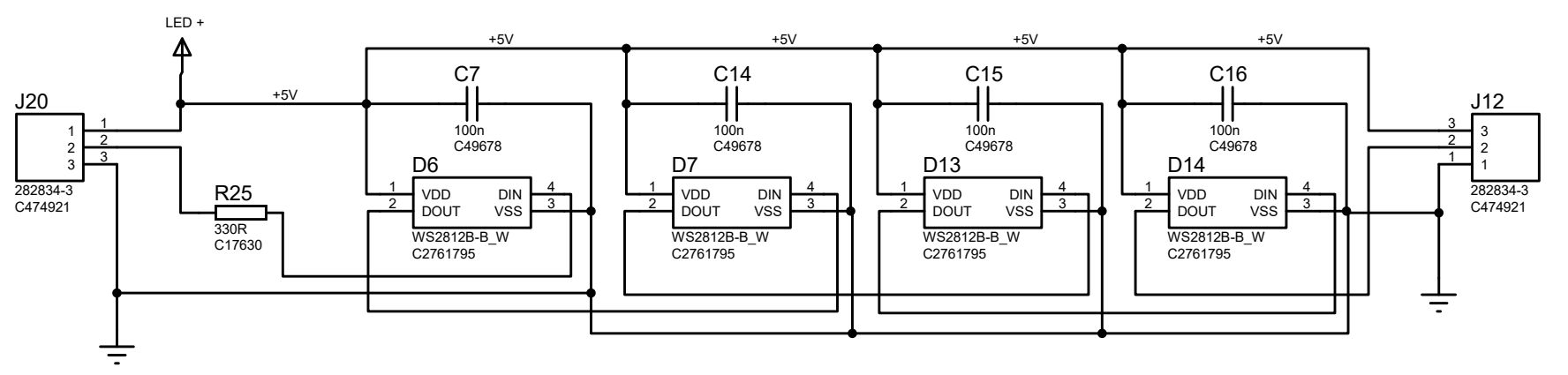
mdb-measureKit variant



Project: mdb-lightKit Version: 1.20221123 Sheet Title: Power, mdb-measureKit Variant BY: M. Buxton	DATE: 11/23/2022 PAGE: 4 of 15 REV: A
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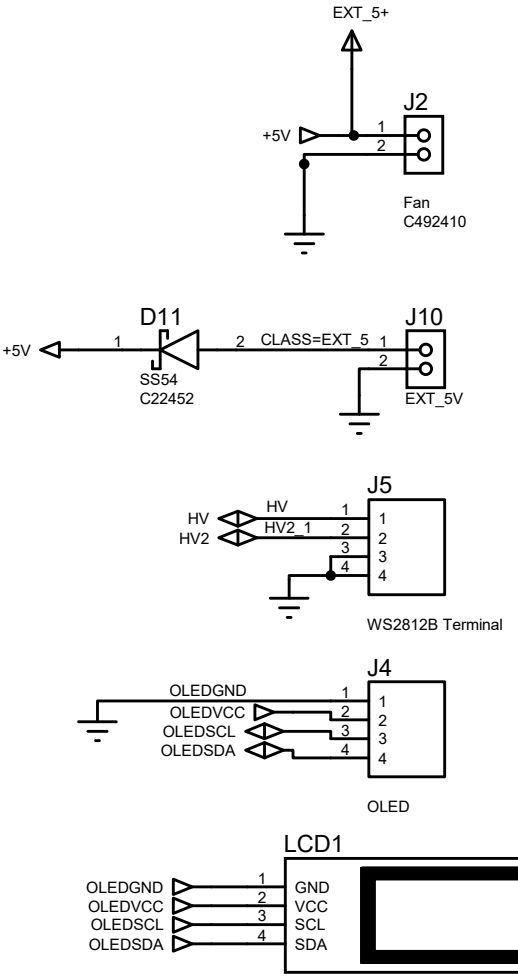
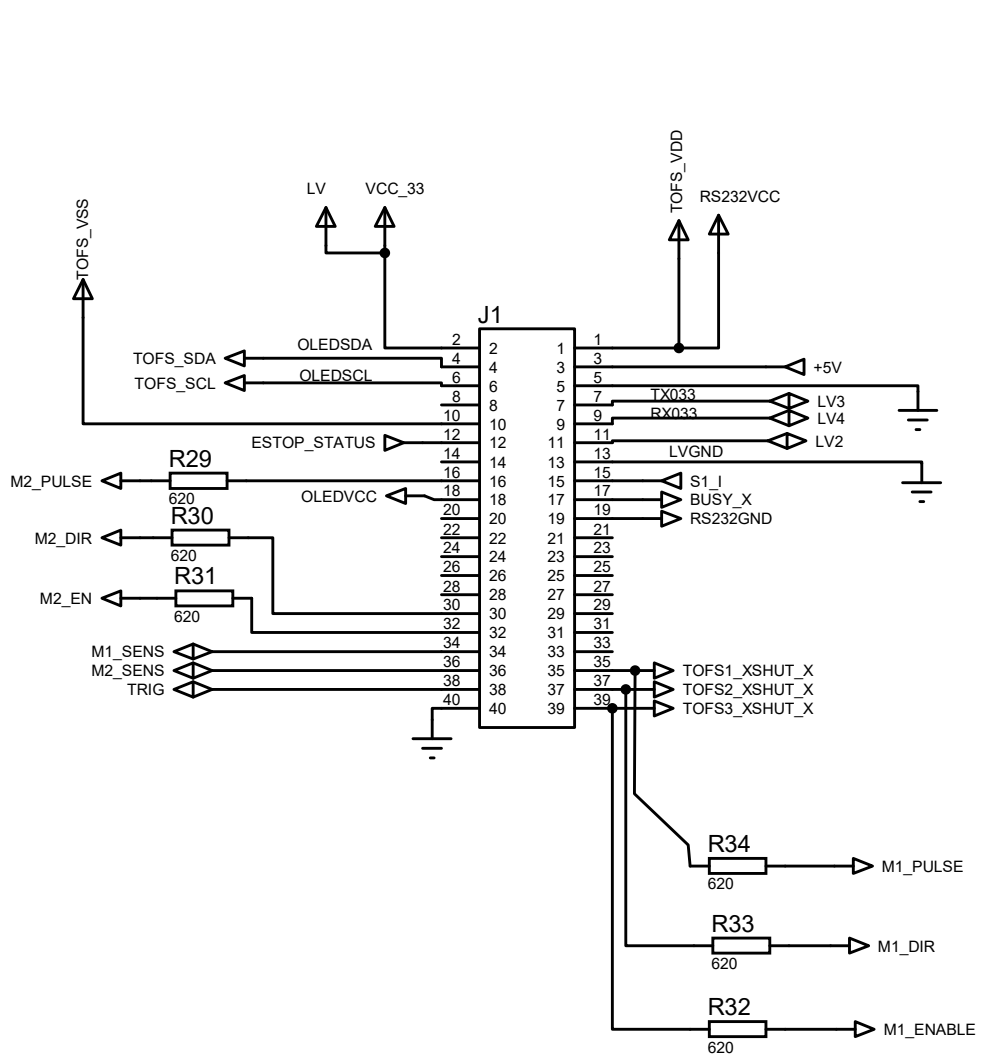
Note:
 Supply Voltage: 5V DC
 Supply Current: 5A
 Max current: 36mA per pixel
 Red = 12mA, Green = 12mA, Blue = 12mA

Maximum number of strips should not exceed 28 (112 pixels) per 5A power supply
 If more strips are required, an additional power supply should be supplied.

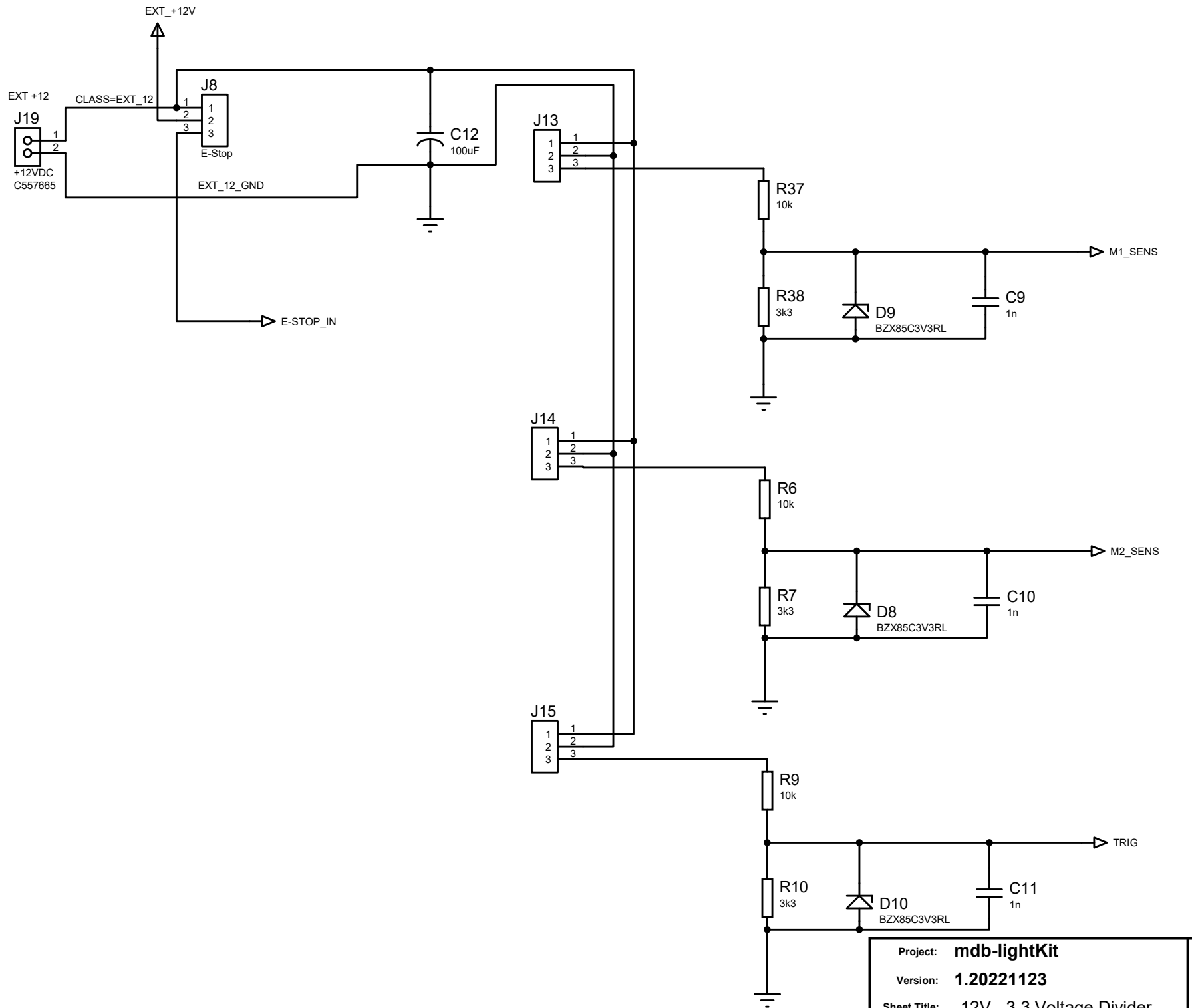


Number of WS2812B LEDs vary

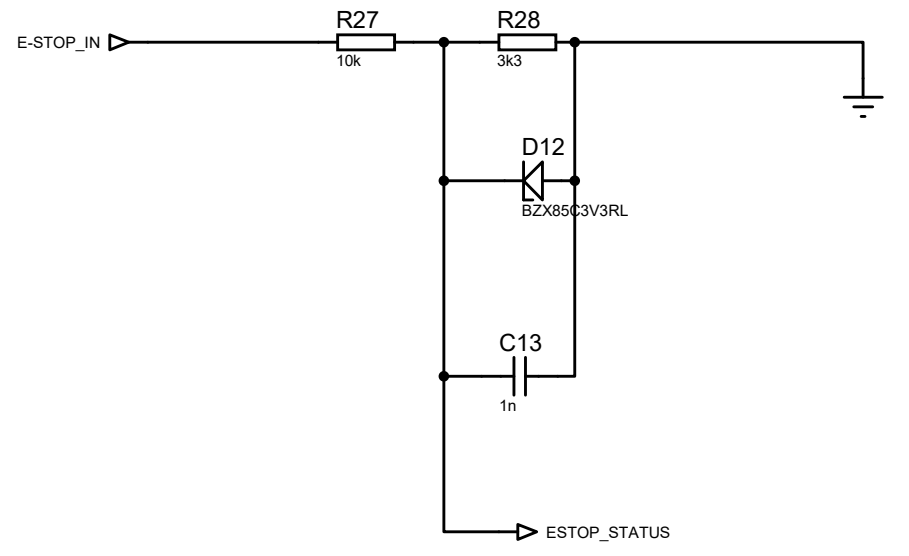
Project: mdb-lightKit	DATE: 11/23/2022
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Sheet Title: LED Strip	REV: A
BY: M. Buxton	



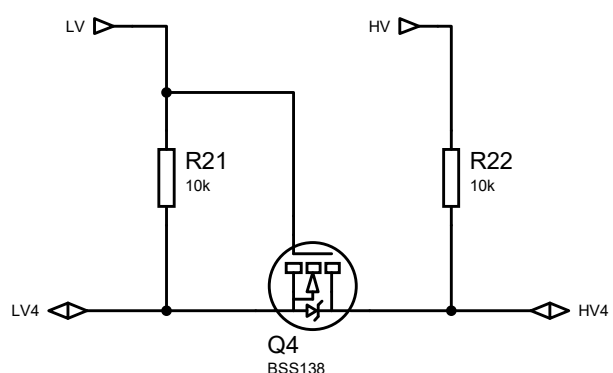
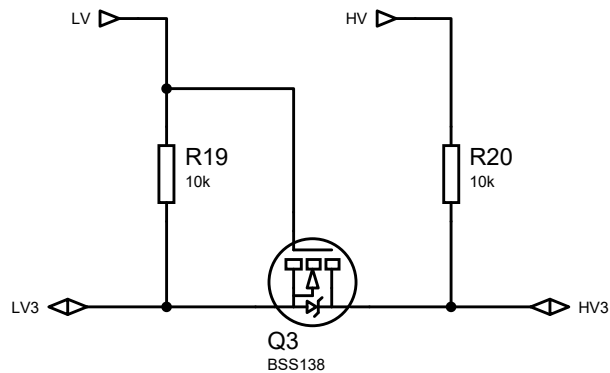
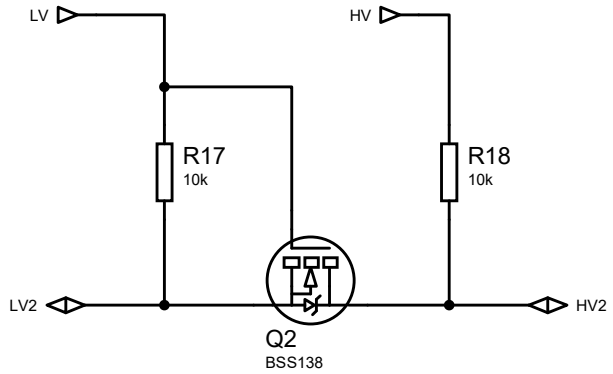
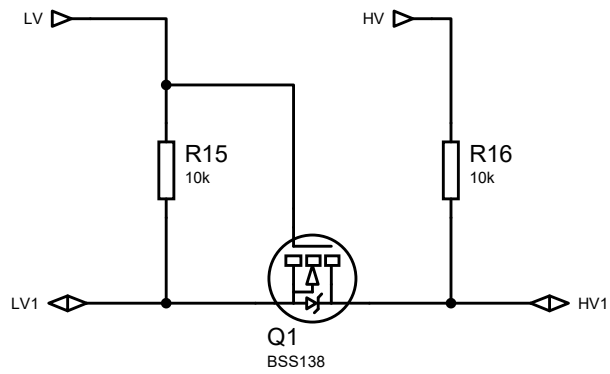
Project: mdb-lightKit	DATE: 11/23/2022
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Sheet Title: Main Controller	REV: A
BY: M. Buxton	



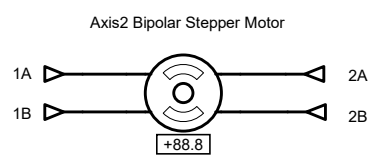
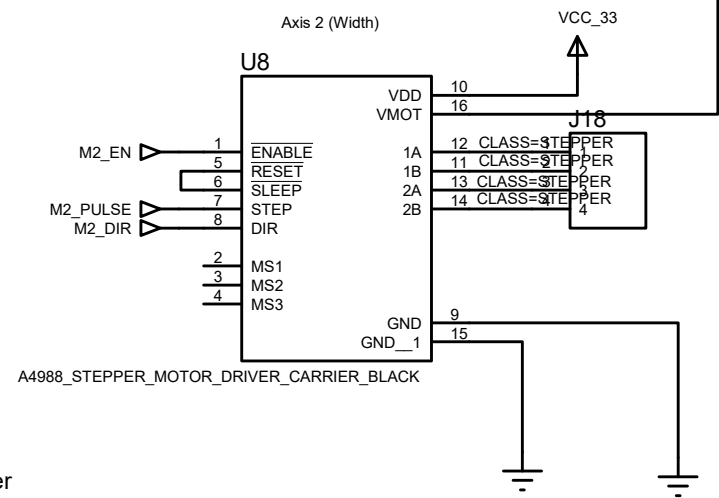
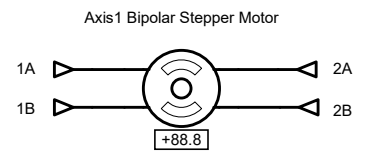
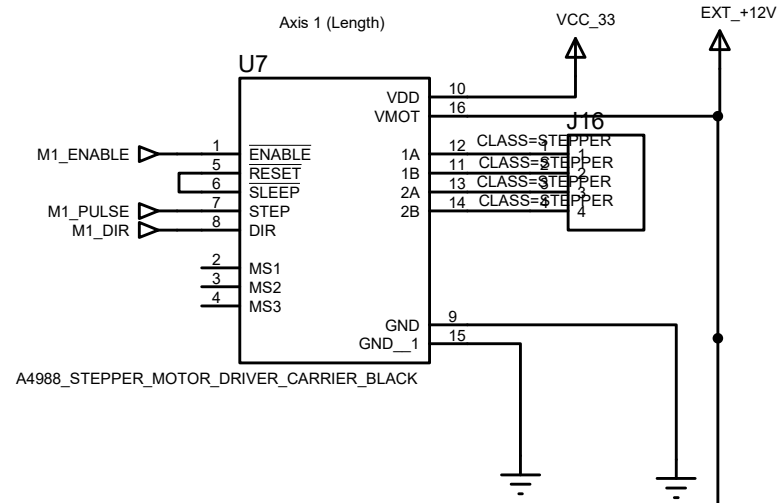
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Sheet Title: 12V - 3.3 Voltage Divider	REV: A
BY: M. Buxton	



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Sheet Title: Emergency Stop	PAGE: 8 of 15
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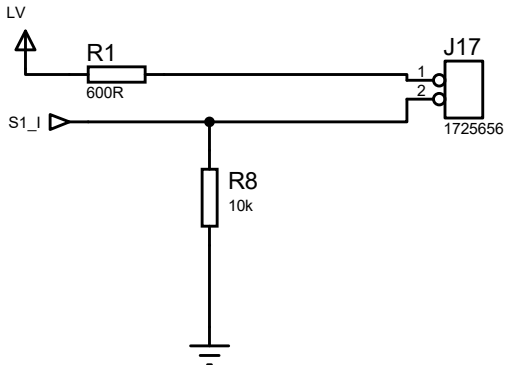
Project: mdb-lightKit	DATE: 11/23/2022
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Sheet Title: Logic Level Shifter	
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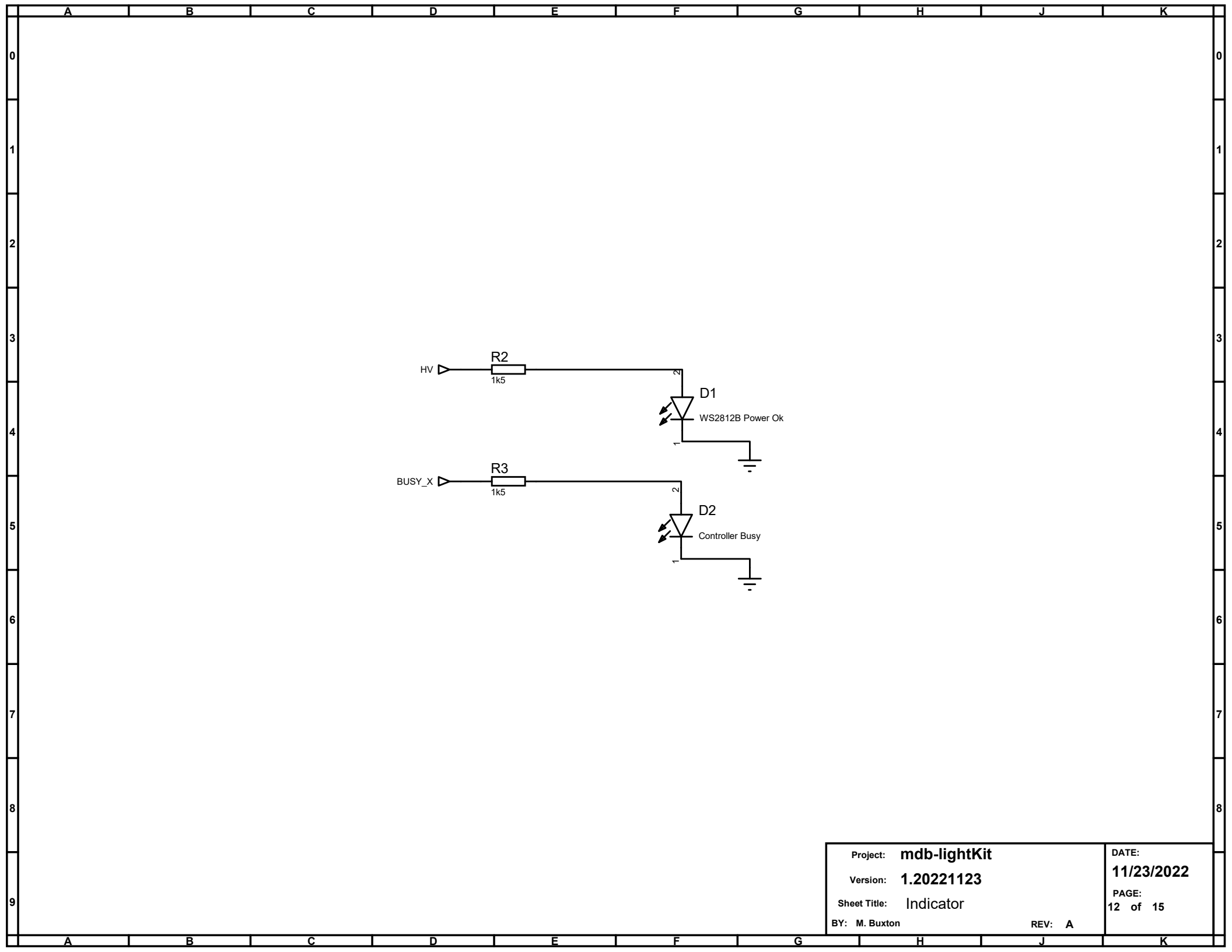
To set the maximum current limit on the stepper motor driver
 $I_{max} = V_{REF} \times 8 \times R_{CS}$
 Default V_{REF} for I_{max} of 1A = 544 mV

$R_{CS} = 0.068$ ohms
 $I_{max} = 1.2$ A without additional cooling, $I_{max} = 1.5$ A with additional cooling

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Sheet Title: Stepper Motor Control	BY: M. Buxton
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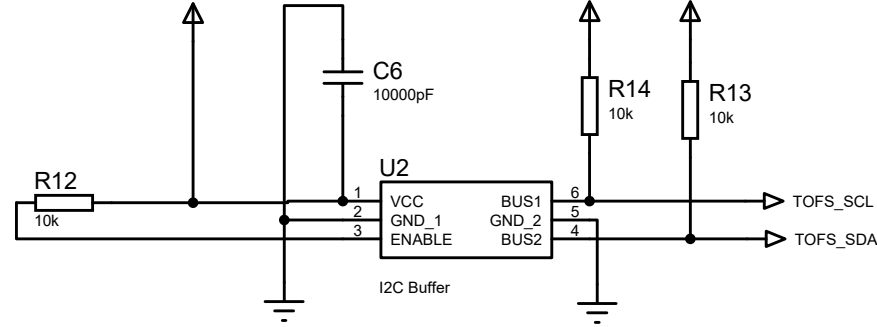


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Sheet Title: External Input	REV: A
BY: M. Buxton	



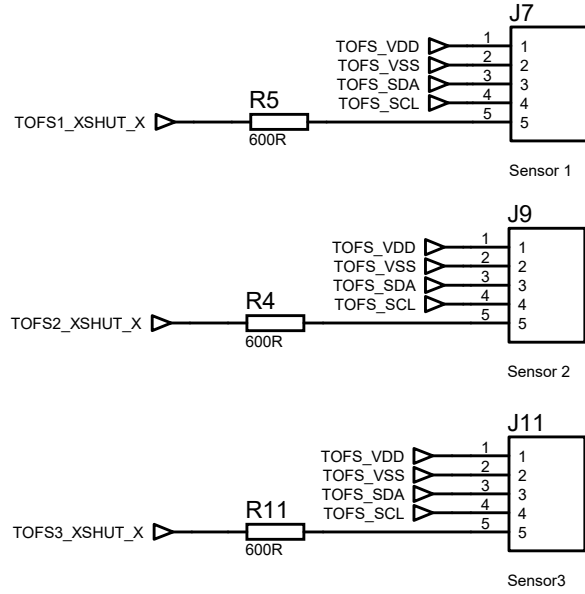
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Sheet Title: Indicator	REV: A
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Inactive 03March2022



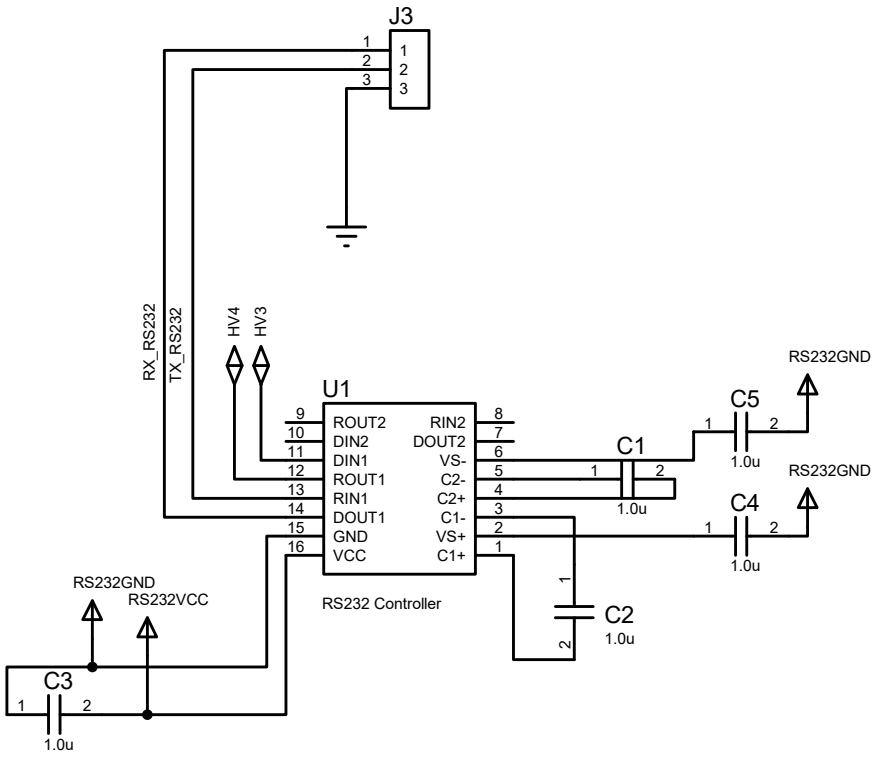
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EXCLUDED FOR STEPPER MOTOR VERSION



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Sheet Title: TOF Sensors	REV: A
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Inactive 03March2022



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Sheet Title: Communications RS232	REV: A
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