

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

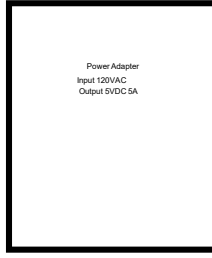
mdb-measureKit Variant

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

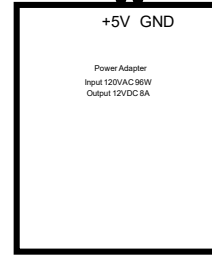
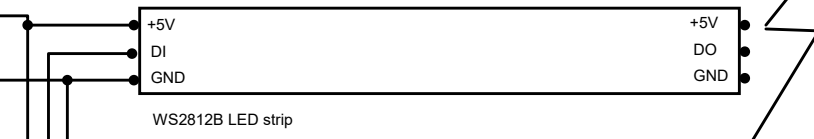
Person Responsible for Project: MBuxton

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Version: 1.20220704	
Sheet Title: Title Page	PAGE: 1 of 15
BY: M. Buxton	REV: B

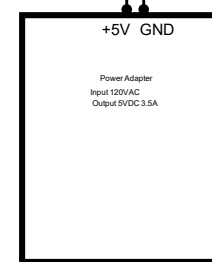
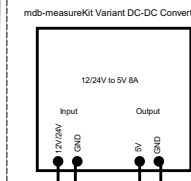
LED Strip Power Supply



Optional LED Visual Feedback



Controller Power Supply



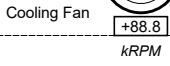
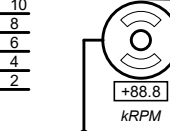
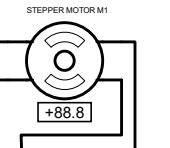
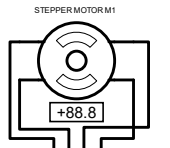
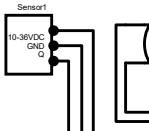
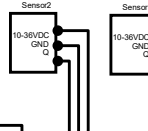
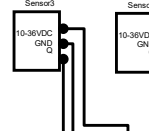
Controller Power Supply

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



Interface Card mdblk002



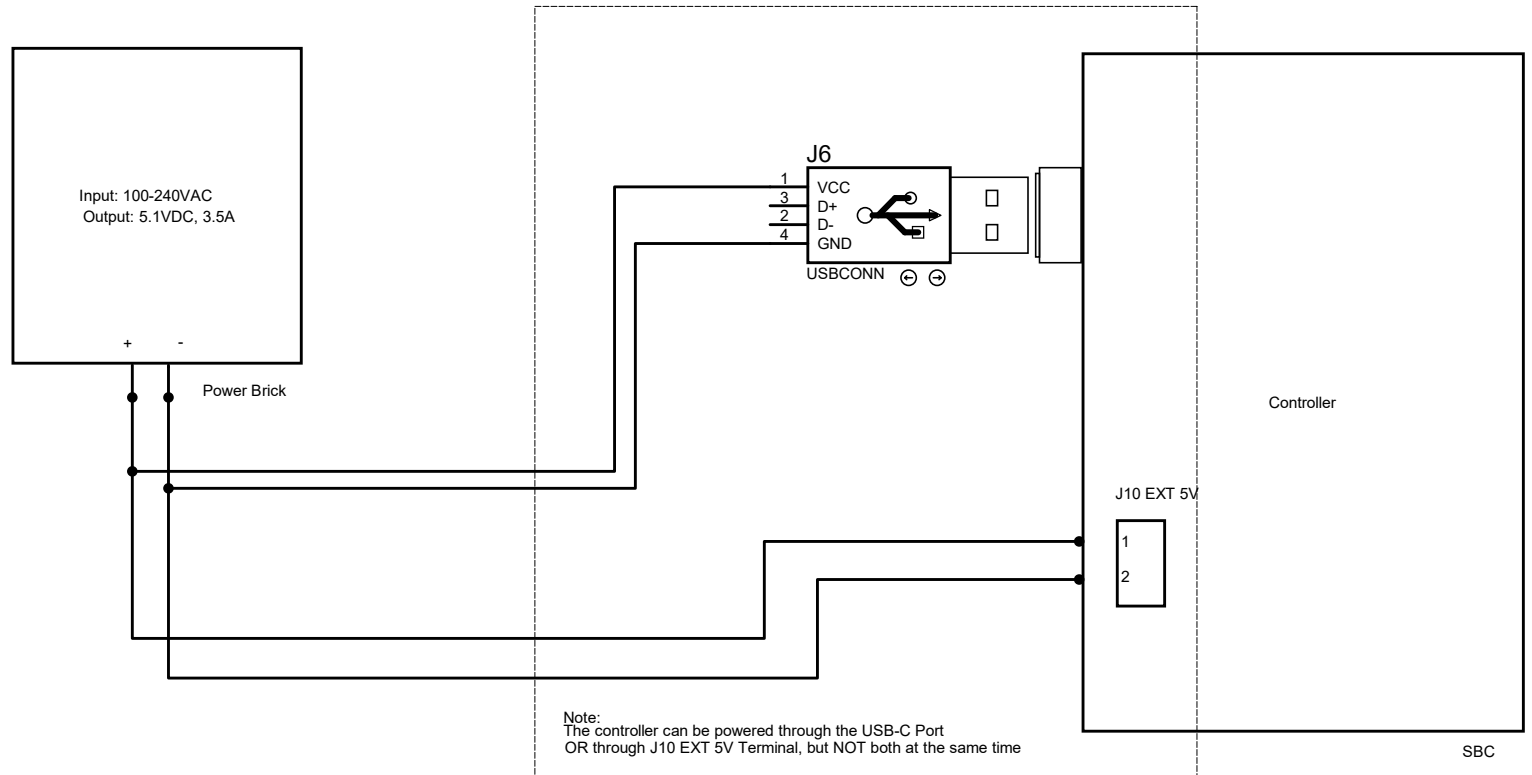
E-Stop Button

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
BY:	M. Buxton	REV:	B

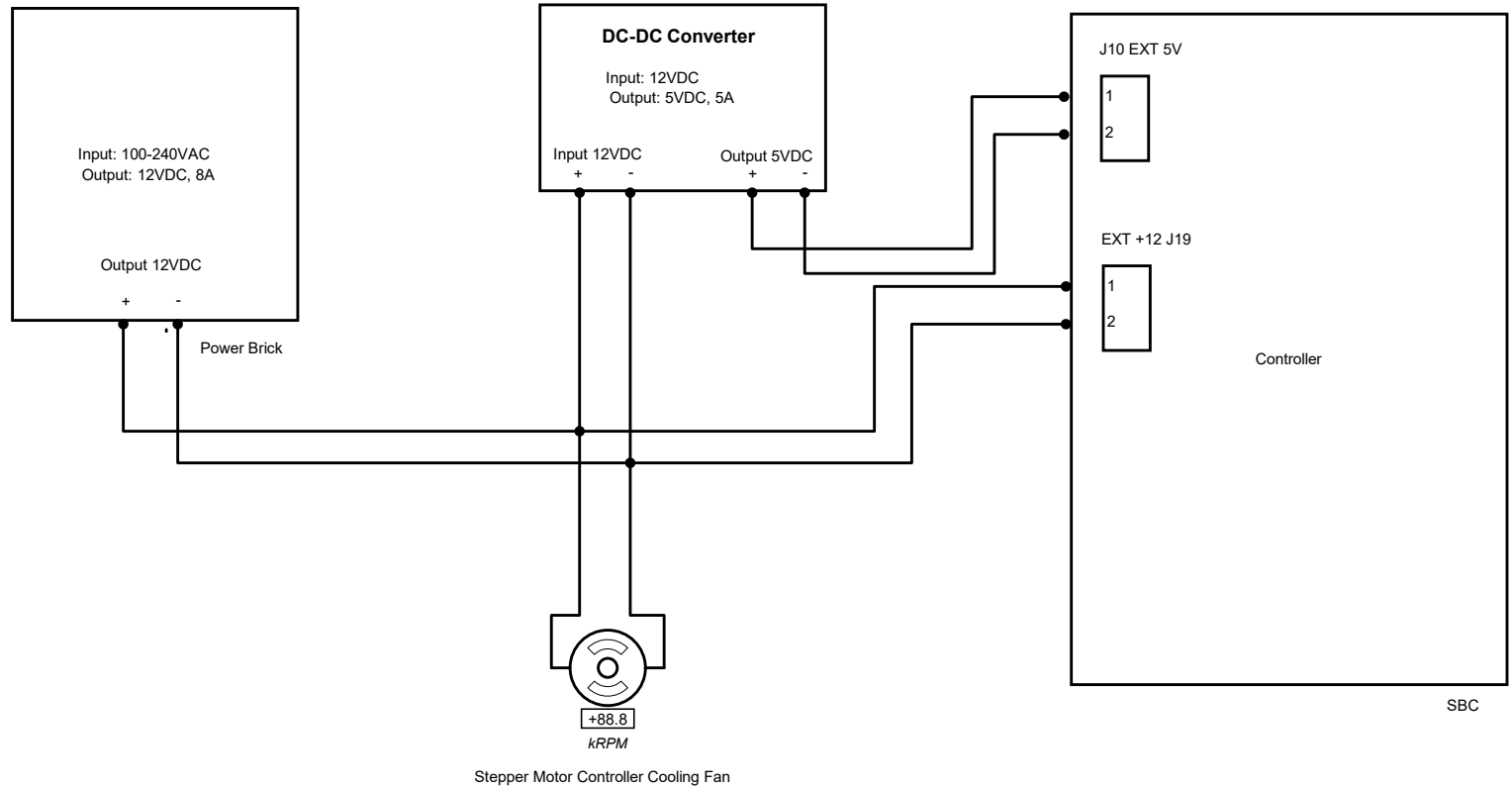
All variants other than mdb-measureKit



Note:
 The controller can be powered through the USB-C Port
 OR through J10 EXT 5V Terminal, but NOT both at the same time

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Sheet Title: Power, Standard Variance	BY: M. Buxton
REV: B	

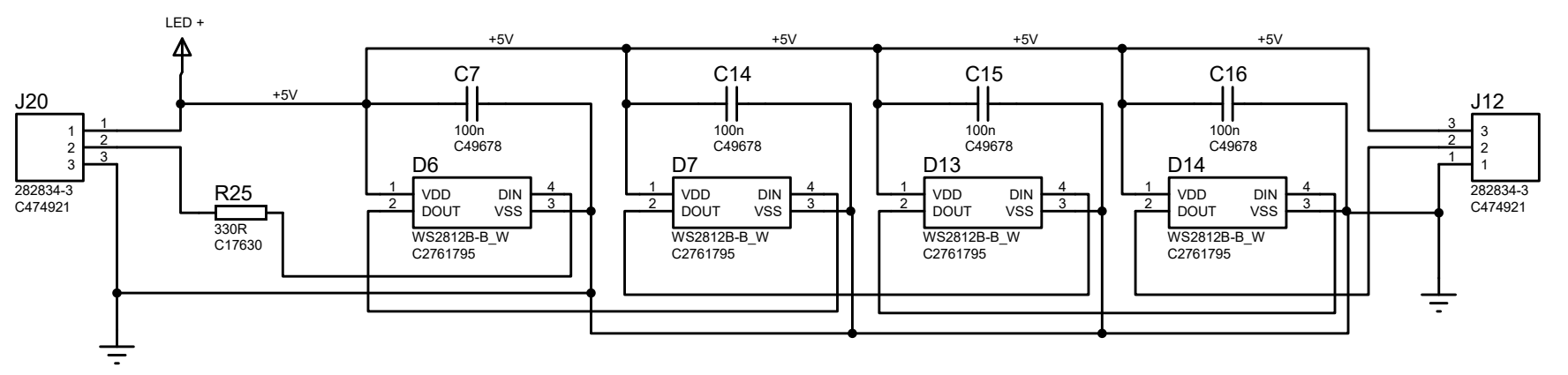
mdb-measureKit variant



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Sheet Title: Power, mdb-measureKit Variant	BY: M. Buxton
REV: B	

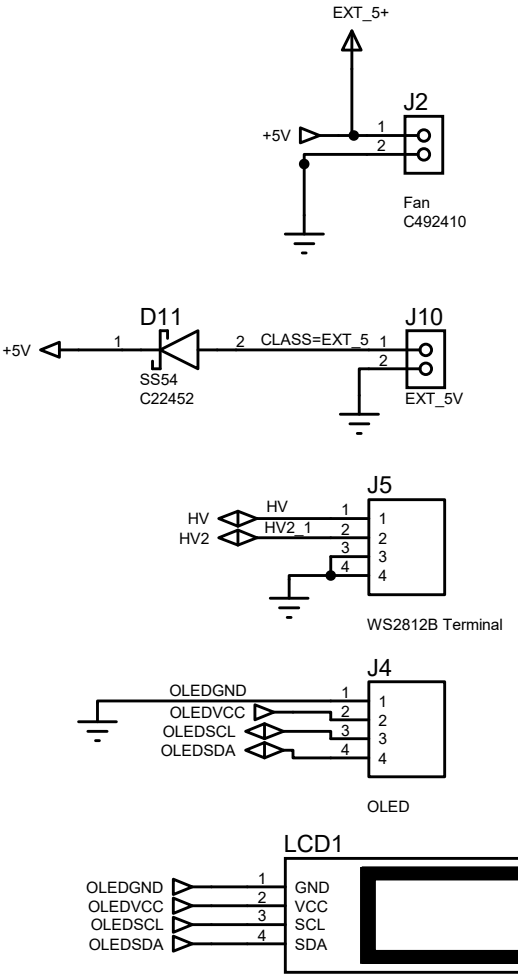
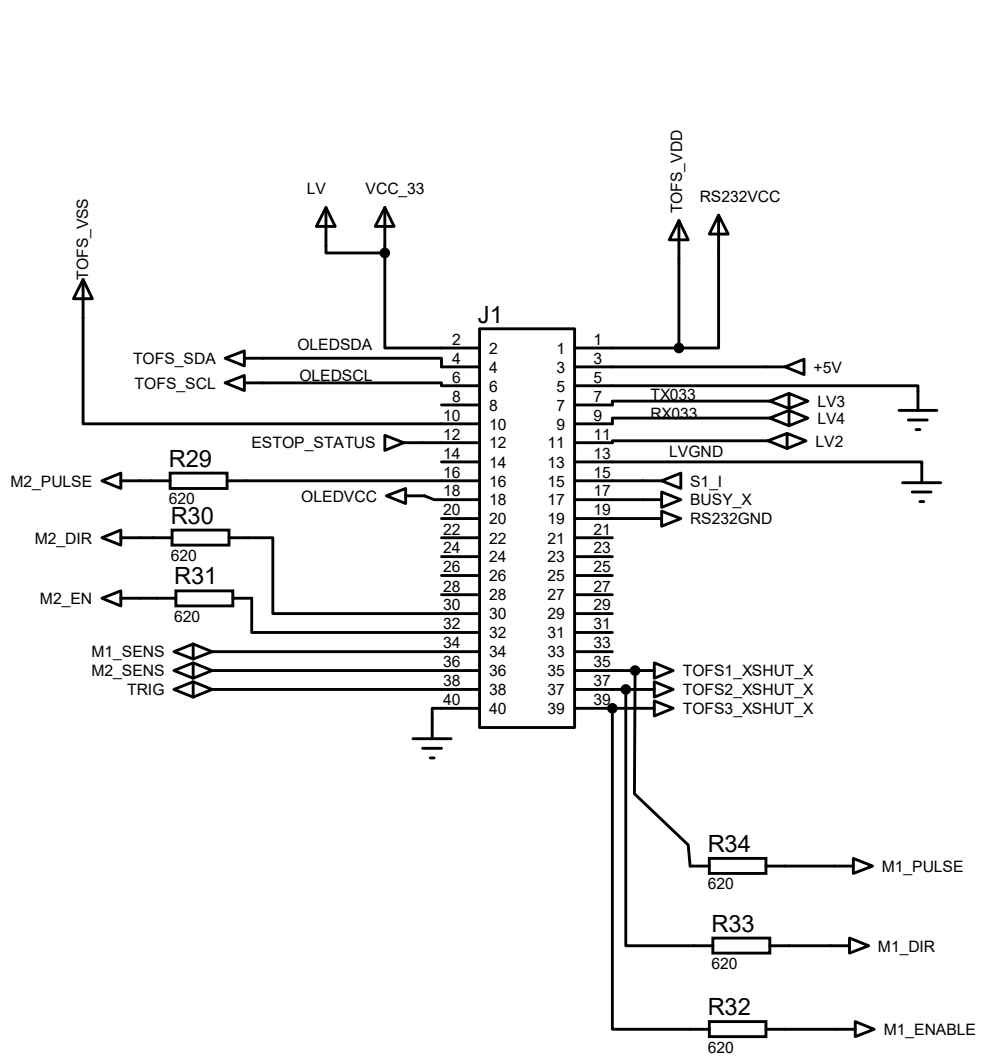
Note:
 Supply Voltage: 5V DC
 Supply Current: 5A
 Max current: 36mA per pixel
 Red = 12mA, Green = 12mA, Blue = 12mA

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.

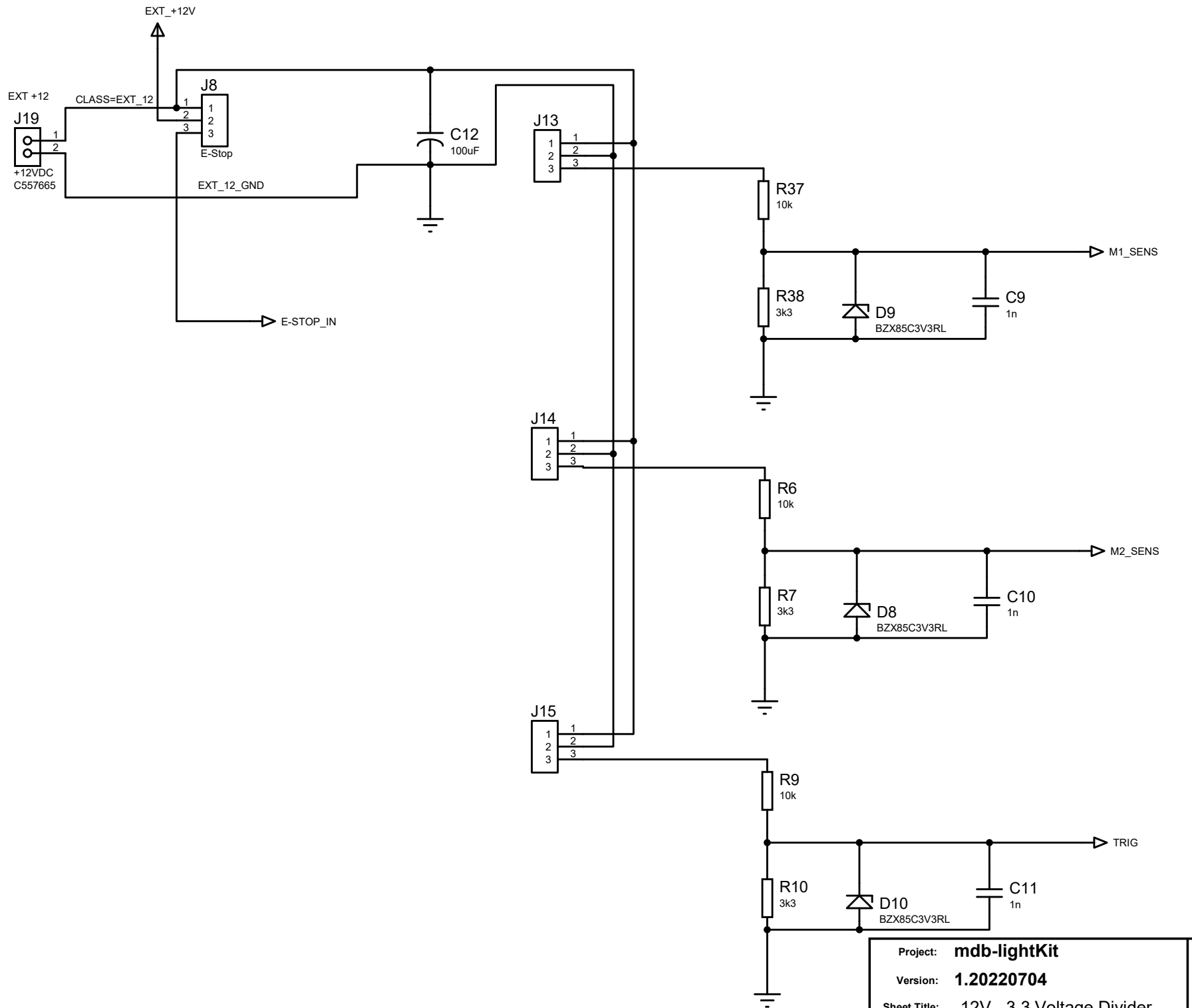


Number of WS2812B LEDs vary

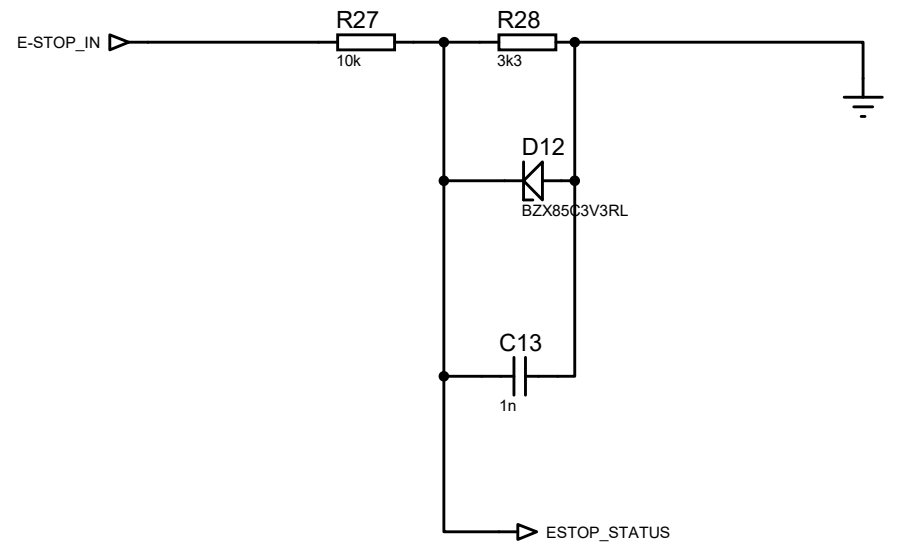
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Sheet Title: LED Strip	
BY: M. Buxton	REV: B



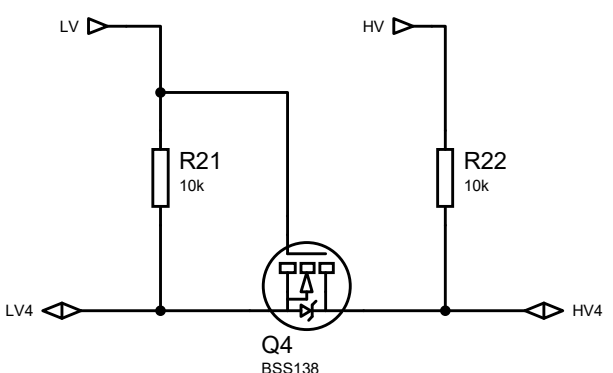
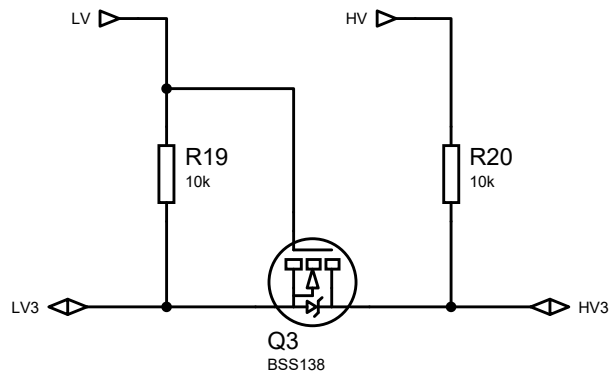
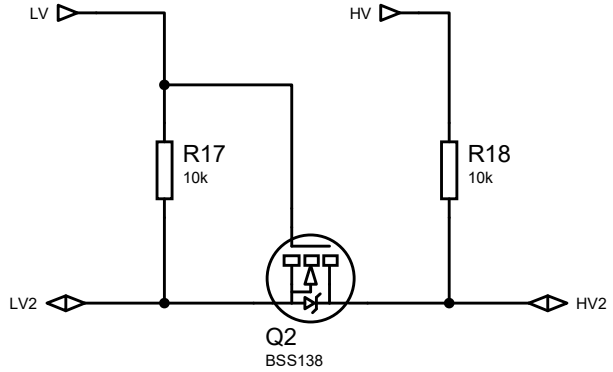
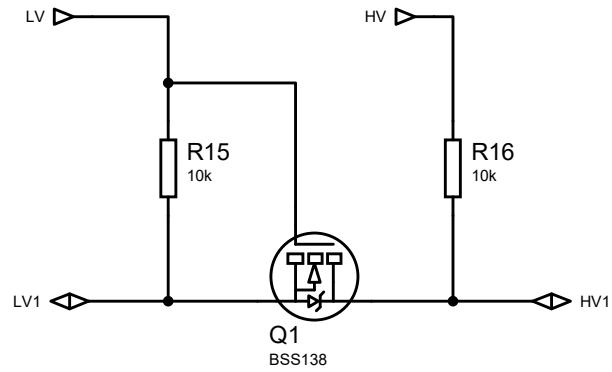
Project: mdb-lightKit	DATE: 9/25/2022
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Sheet Title: Main Controller	REV: B
BY: M. Buxton	



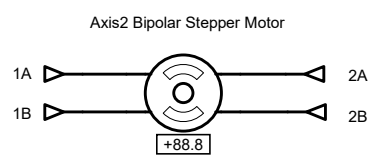
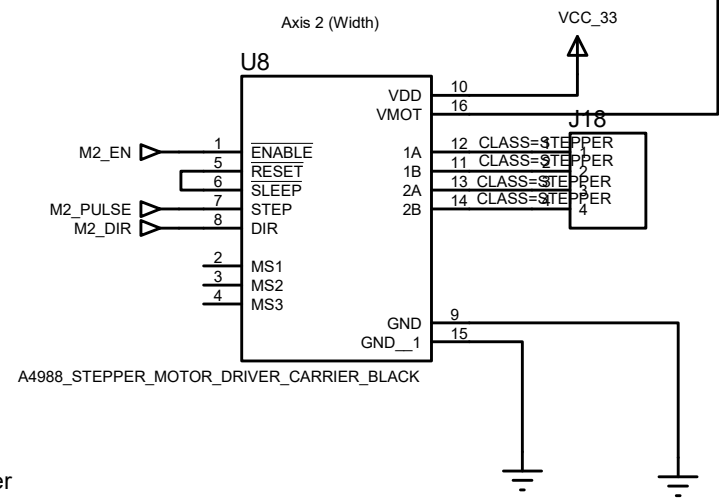
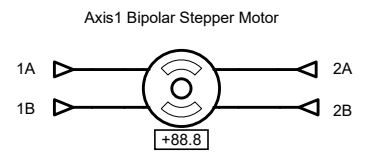
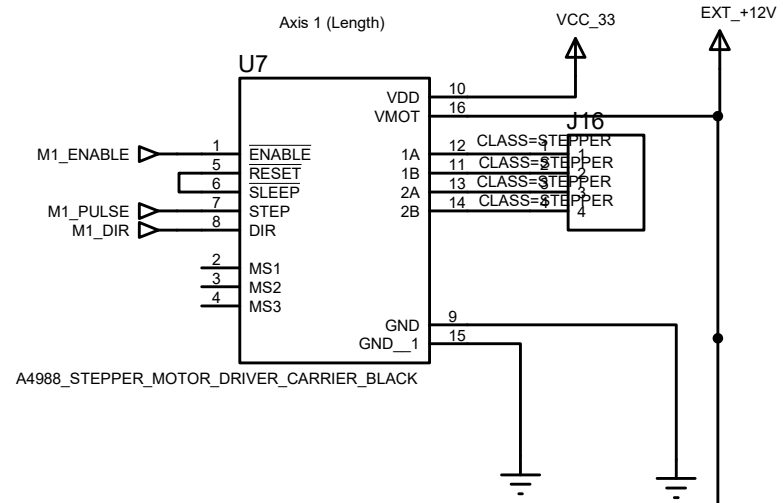
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Sheet Title: 12V - 3.3 Voltage Divider	REV: B
BY: M. Buxton	



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Sheet Title: Emergency Stop	REV: B
BY: M. Buxton	



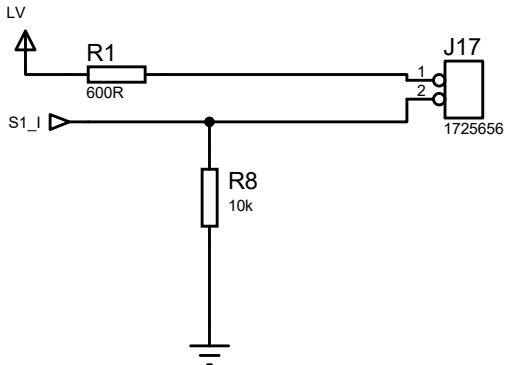
Project: mdb-lightKit	DATE: 9/25/2022
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Sheet Title: Logic Level Shifter	
BY: M. Buxton	REV: B



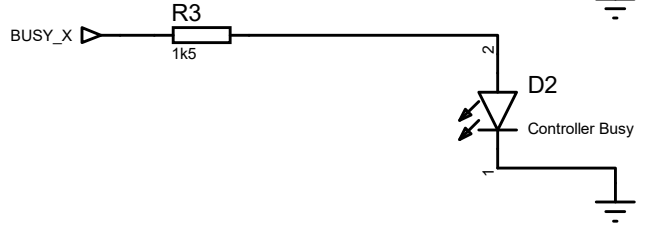
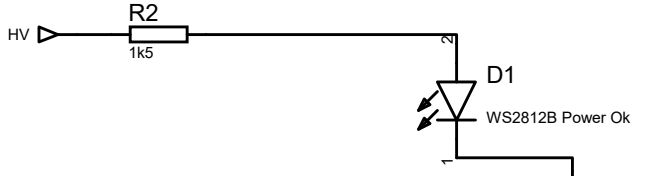
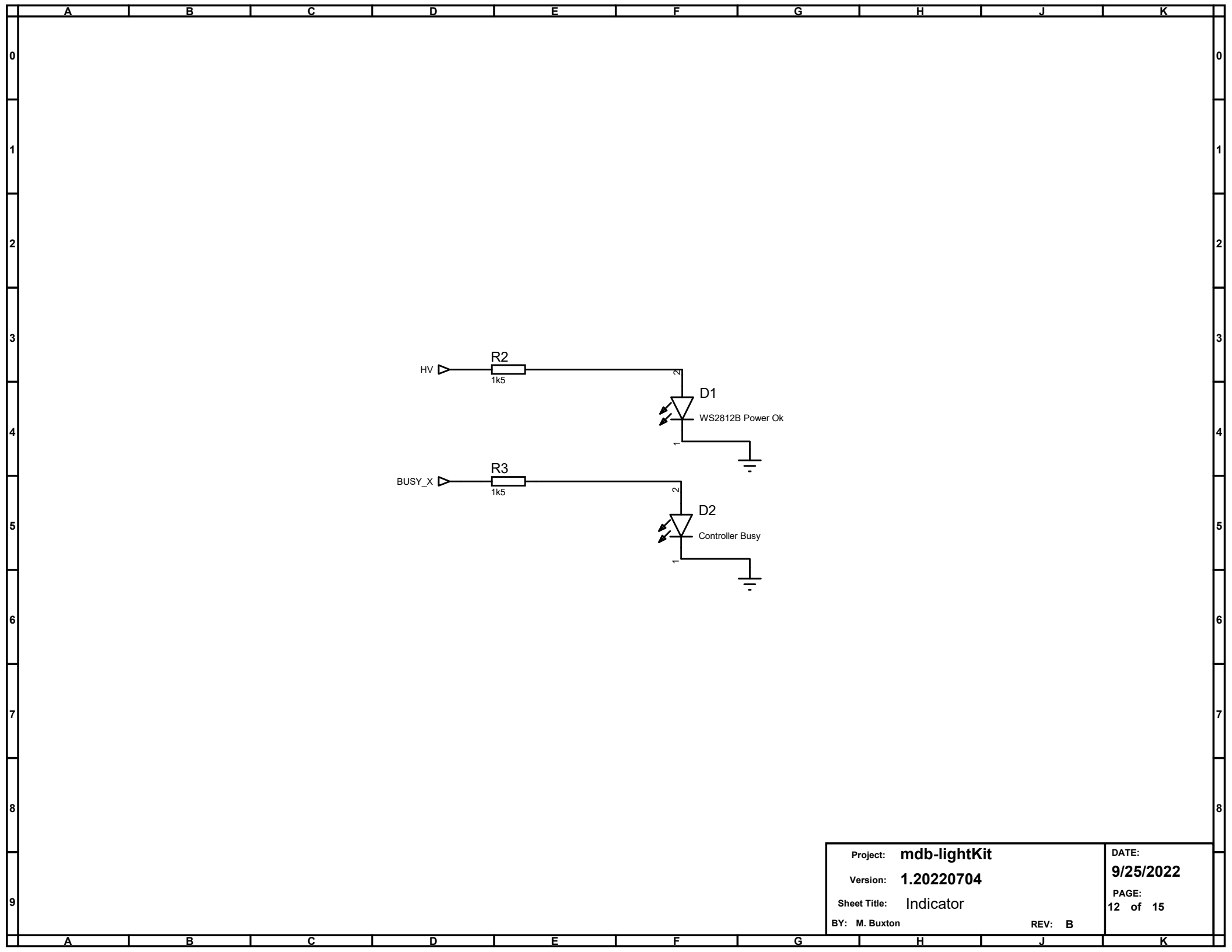
To set the maximum current limit on the stepper motor driver
 $I_{max} = V_{REF} \times 8 \times R_{CS}$
 Default V_{REF} for I_{max} of 1A = 544 mV

$R_{CS} = 0.068$ 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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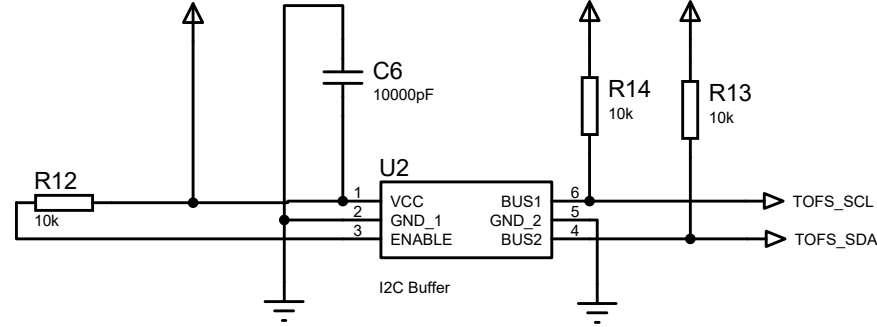


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Sheet Title: External Input	REV: B
BY: M. Buxton	



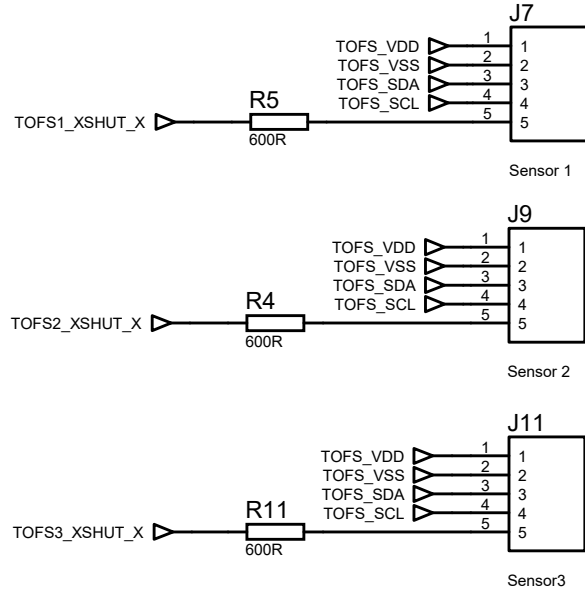
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Sheet Title: Indicator	REV: B
BY: M. Buxton	

Inactive 03March2022



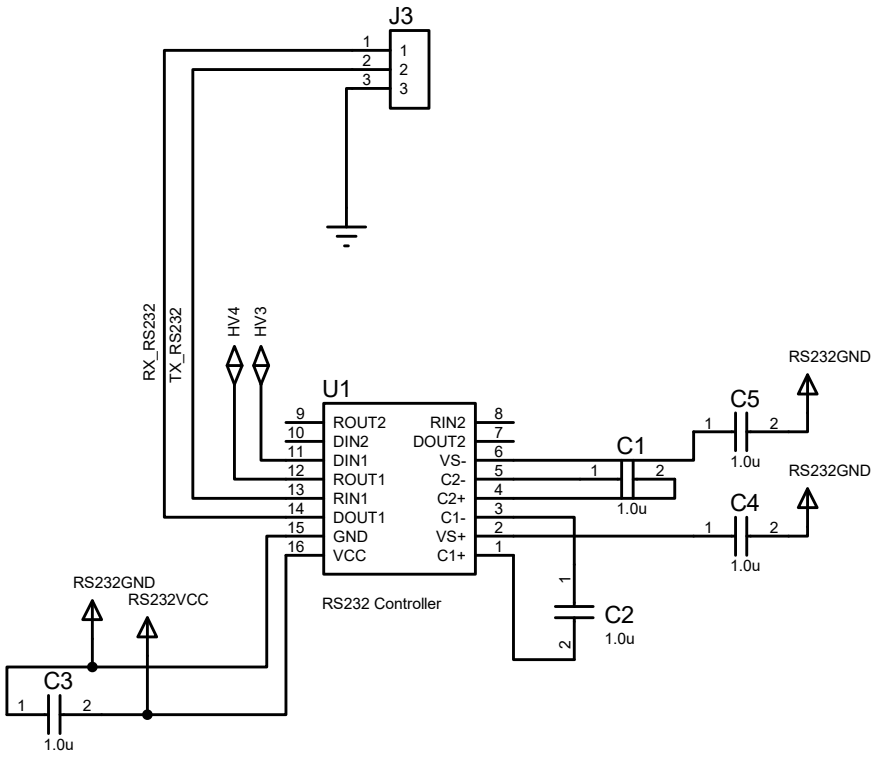
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Sheet Title: I2C Buffer	REV: B
BY: M. Buxton	

EXCLUDED FOR STEPPER MOTOR VERSION



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Sheet Title: TOF Sensors	REV: B
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Inactive 03March2022



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Sheet Title: Communications RS232	REV: B
BY: M. Buxton	