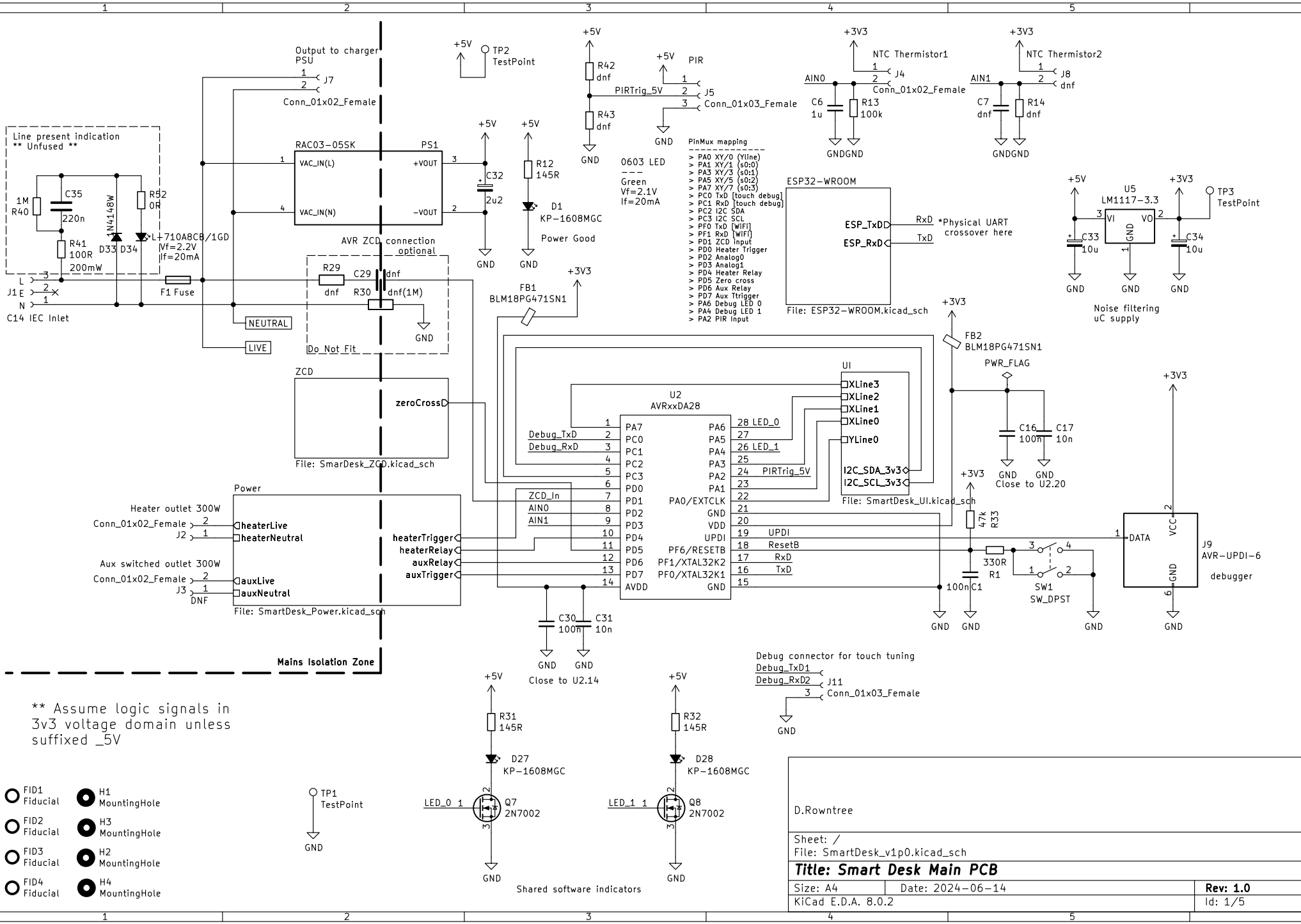
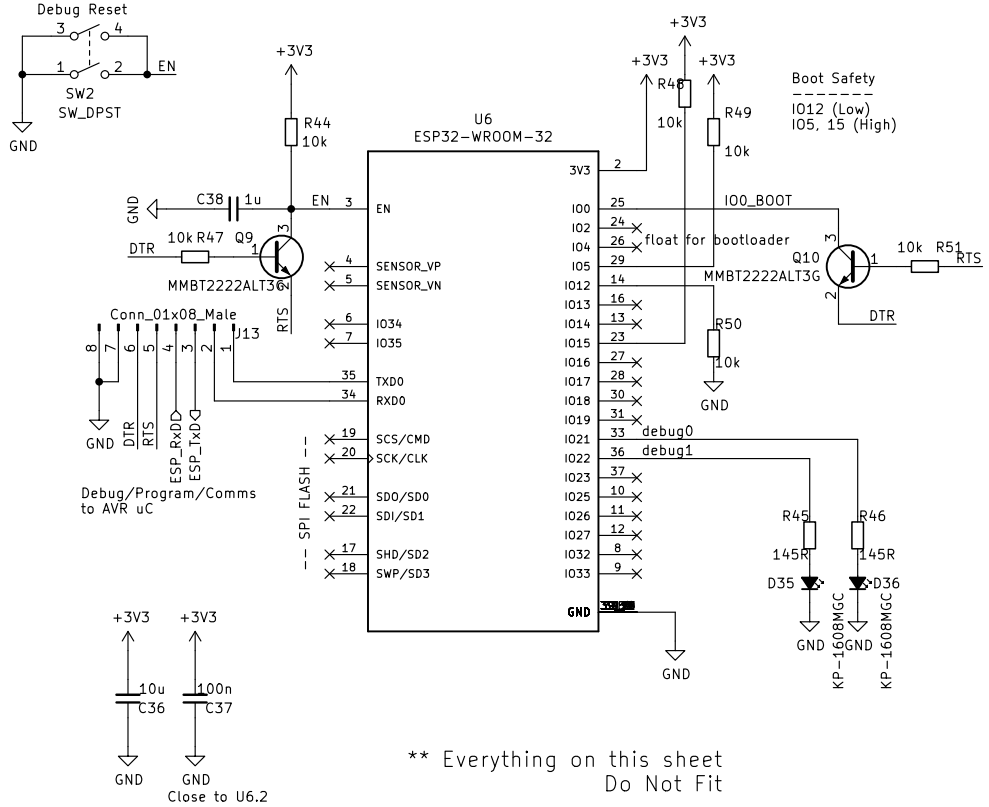

Output to charger PSU
J7
Conn_01x02_Female
TP2
TestPoint
R42
dnf
R43
dnf
PIR
PIRTrig_5V
J5
Conn_01x03_Female
0603 LED
Green
Vf=2.1V
If=20mA
PinMux mapping
> PA0 XY/0 (YLine)
> PA1 XY/1 (s0:0)
> PA3 XY/3 (s0:1)
> PA5 XY/5 (s0:2)
> PA7 XY/7 (s0:3)
> PC0 TxD [touch debug]
> PC1 RxD [touch debug]
> PC2 I2C SDA
> PC3 I2C SCL
> PF0 TxD [WiFi]
> PF1 RxD [WiFi]
> PD1 ZCD input
> PD0 Heater Trigger
> PD2 Analog0
> PD3 Analog1
> PD4 Heater Relay
> PD5 Zero cross
> PD6 Aux Relay
> PD7 Aux Ttrigger
> PA6 Debug LED 0
> PA4 Debug LED 1
> PA2 PIR input
NTC Thermistor1
J4
Conn_01x02_Female
AIN0
C6
1u
R13
100k
NTC Thermistor2
J8
dnf
AIN1
C7
dnf
R14
dnf
GNDGND
Line present indication
** Unfused **
1M
R40
C35
220n
R41
100R
200mW
1N4148W
D33 D34
R52
0R
L-710A8CB/1GD
Vf=2.2V
If=20mA
C14 IEC Inlet
F1 Fuse
NEUTRAL
LIVE
RAC03-05SK
PS1
VAC_IN(L)
VAC_IN(N)
+VOUT
-VOUT
C32
2u2
R12
145R
D1
KP-1608MGC
Power Good
AVR ZCD connection
optional
R29
dnf
C29
dnf
R30
dnf(1M)
Do_Not_Fit
ZCD
zeroCross
File: SmarDesk_ZCD.kicad_sch
FB1
BLM18PG471SN1
ESP32-WROOM
ESP_TxD
ESP_RxD
RxD
TxD
*Physical UART crossover here
File: ESP32-WROOM.kicad_sch
U5
LM1117-3.3
VI
VO
GND
C33
10u
C34
10u
TP3
TestPoint
Noise filtering
uC supply
FB2
BLM18PG471SN1
PWR_FLAG
C16
100n
C17
10n
Close to U2.20
U2
AVRxxDA28
PA7
PC0
PC1
PC2
PC3
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
AVDD
PA6
PA5
PA4
PA3
PA2
PA1
PA0/EXTCLK
GND
VDD
UPDI
PF6/RESETB
PF1/XTAL32K2
PF0/XTAL32K1
GND
LED_0
LED_1
PIRTrig_5V
UPDI
ResetB
RxD
TxD
Debug_TxD
Debug_RxD
ZCD_In
AIN0
AIN1
UI
XLine3
XLine2
XLine1
XLine0
YLine0
I2C_SDA_3v3
I2C_SCL_3v3
File: SmartDesk_UI.kicad_sch
47k
R33
330R
R1
100n
C1
SW1
SW_DPST
J9
AVR-UPDI-6
debugger
DATA
VCC
GND
Power
Heater outlet 300W
Conn_01x02_Female
J2
heaterLive
heaterNeutral
Aux switched outlet 300W
J3
DNF
auxLive
auxNeutral
heaterTrigger
heaterRelay
auxRelay
auxTrigger
File: SmartDesk_Power.kicad_sch
C30
100n
C31
10n
Close to U2.14
Mains Isolation Zone
Debug connector for touch tuning
Debug_TxD1
Debug_RxD2
J11
Conn_01x03_Female
** Assume logic signals in 3v3 voltage domain unless suffixed _5V
R31
145R
D27
KP-1608MGC
Q7
2N7002
LED_0
R32
145R
D28
KP-1608MGC
Q8
2N7002
LED_1
Shared software indicators
TP1
TestPoint
FID1 Fiducial
FID2 Fiducial
FID3 Fiducial
FID4 Fiducial
H1 MountingHole
H3 MountingHole
H2 MountingHole
H4 MountingHole
D.Rowntree
Sheet: /
File: SmartDesk_v1p0.kicad_sch
Title: Smart Desk Main PCB
Size: A4
Date: 2024-06-14
Rev: 1.0
KiCad E.D.A. 8.0.2
Id: 1/5



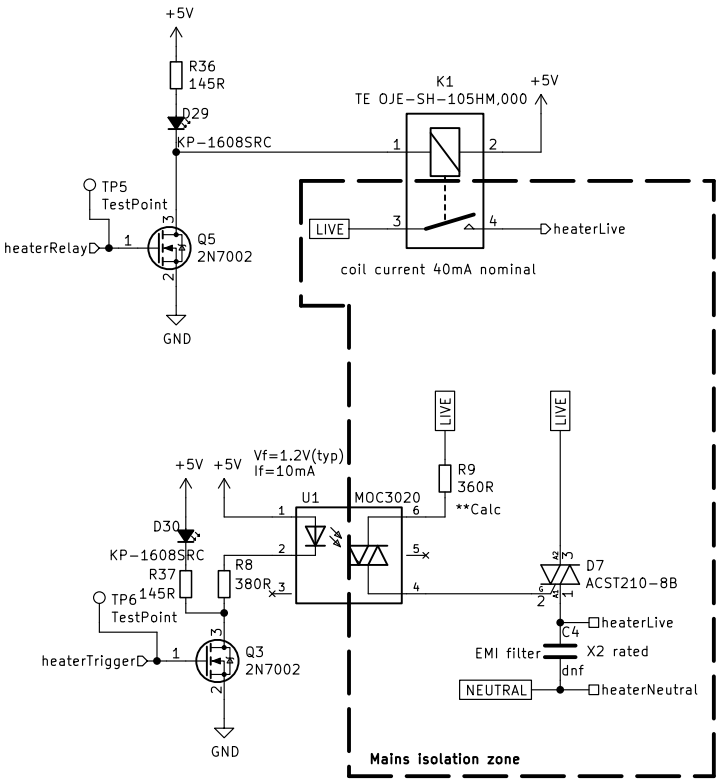
Name	No.	Type	Function
GND	1	P	Ground
3V3	2	P	Power supply.
EN	3	I	Chip-enable signal. Active high.
SENSOR_VP	4	I	GPIO36, SENSOR_VP, ADC_H, ADC1_CH0, RTC_GPIO0
SENSOR_VN	5	I	GPIO39, SENSOR_VN, ADC1_CH3, ADC_H, RTC_GPIO3
IO34	6	I	GPIO34, ADC1_CH6, RTC_GPIO4
IO35	7	I	GPIO35, ADC1_CH7, RTC_GPIO5
IO32	8	I/O	GPIO32, XTAL_32K_P (32.768 kHz crystal oscillator input), ADC1_CH4, TOUCH9, RTC_GPIO9
IO33	9	I/O	GPIO33, XTAL_32K_N (32.768 kHz crystal oscillator output), ADC1_CH5, TOUCH8, RTC_GPIO8
IO25	10	I/O	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RXD0
IO26	11	I/O	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RXD1
IO27	12	I/O	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC_RX_DV
IO14	13	I/O	GPIO14, ADC2_CH6, TOUCH6, RTC_GPIO16, MTMS, HSPICLK, HS2_CLK, SD_CLK, EMAC_TXD2
IO12	14	I/O	GPIO12, ADC2_CH5, TOUCH5, RTC_GPIO15, MTDI, HSPIQ, HS2_DATA2, SD_DATA2, EMAC_TXD3
GND	15	P	Ground
IO13	16	I/O	GPIO13, ADC2_CH4, TOUCH4, RTC_GPIO14, MTCK, HSPID, HS2_DATA3, SD_DATA3, EMAC_RX_ER
SHD/SD2*	17	I/O	GPIO9, SD_DATA2, SPIHD, HS1_DATA2, U1RXD
SWP/SD3*	18	I/O	GPIO10, SD_DATA3, SPIWP, HS1_DATA3, U1TXD
SCS/CMD*	19	I/O	GPIO11, SD_CMD, SPICS0, HS1_CMD, U1RTS
SCK/CLK*	20	I/O	GPIO6, SD_CLK, SPICLK, HS1_CLK, U1CTS
SDO/SD0*	21	I/O	GPIO7, SD_DATA0, SPIQ, HS1_DATA0, U2RTS
SDI/SD1*	22	I/O	GPIO8, SD_DATA1, SPID, HS1_DATA1, U2CTS
IO15	23	I/O	GPIO15, ADC2_CH3, TOUCH3, MTDO, HSPICS0, RTC_GPIO13, HS2_CMD, SD_CMD, EMAC_RXD3
IO2	24	I/O	GPIO2, ADC2_CH2, TOUCH2, RTC_GPIO12, HSPIWP, HS2_DATA0, SD_DATA0
IO0	25	I/O	GPIO0, ADC2_CH1, TOUCH1, RTC_GPIO11, CLK_OUT1, EMAC_TX_CLK
IO4	26	I/O	GPIO4, ADC2_CH0, TOUCH0, RTC_GPIO10, HSPIHD, HS2_DATA1, SD_DATA1, EMAC_TX_ER
IO16	27	I/O	GPIO16, HS1_DATA4, U2RXD, EMAC_CLK_OUT
IO17	28	I/O	GPIO17, HS1_DATA5, U2TXD, EMAC_CLK_OUT_180
IO5	29	I/O	GPIO5, VSPICS0, HS1_DATA6, EMAC_RX_CLK
IO18	30	I/O	GPIO18, VSPICLK, HS1_DATA7
IO19	31	I/O	GPIO19, VSPIQ, U0CTS, EMAC_TXD0

D.Rowntree

Sheet: /ESP32-WROOM/
File: ESP32-WROOM.kicad_sch

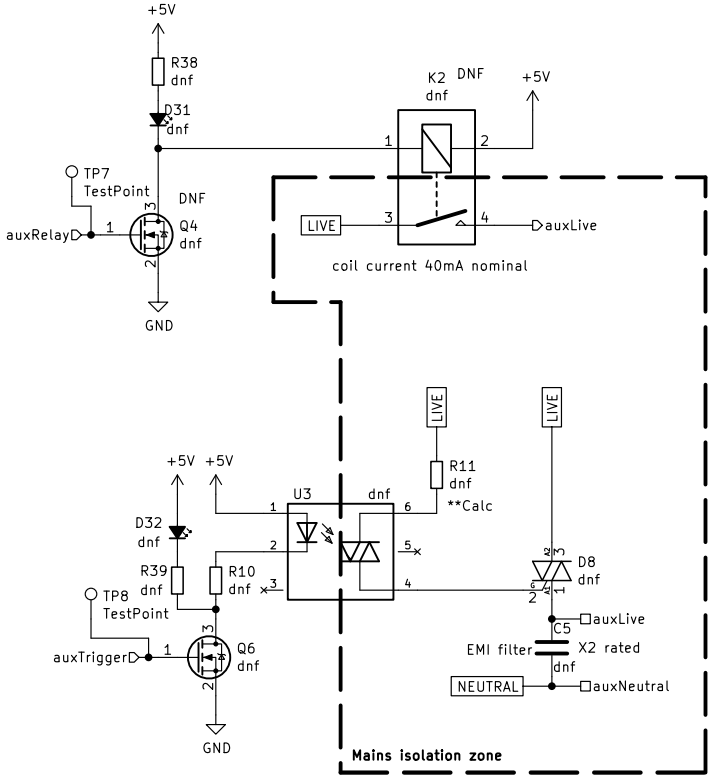
Title: Smart Desk Main PCB

Size: A4	Date: 2024-06-14	**Rev: 1.0**
KiCad E.D.A. 8.0.2		Id: 2/5



0603 LED
Red
Vf=tbd
If=20mA

substitute green for now
Vf=2.1V



Main Switch Side:
Populate either:
1. Relay option: R36, D29, Q5, K1
2. FET option: D30, R3/8/9, Q3, D7 [C4 optional if EMI an issue]

Auxilliary switch side:
Do Not Fit ANY parts

D.Rowntree		
Sheet: /Power/ File: SmartDesk_Power.kicad_sch		
Title: Smart Desk Main PCB		
Size: A4	Date: 2024-06-14	**Rev: 1.0**
KiCad E.D.A. 8.0.2		Id: 3/5

PZ1
Panel-tab-edge

PZ2
Panel-tab-edge

PZ3
Panel-tab-edge

FID5
Fiducial

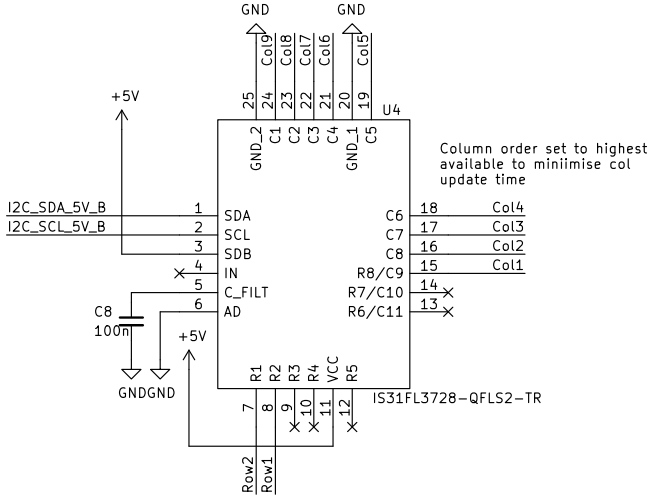
FID6
Fiducial

LED Forward voltages

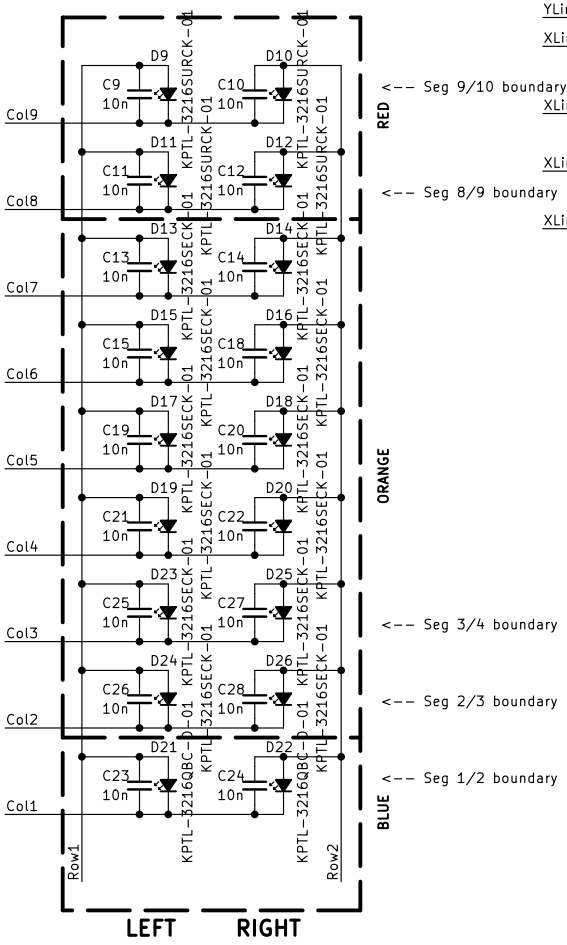
Blue 3.3 - 4V @ 20mA
Orange 2.1-2.5V @ 20mA
Red 1.95 - 2.5V @ 20mA

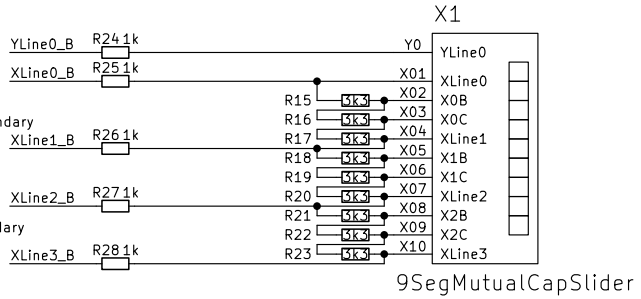
Driver Vcc headroom 200mV

**** ERRATA**
> Add 100nF // 1uF decoupling to Vcc!



** Driver needs to operate at 5V due to blue led forward voltage

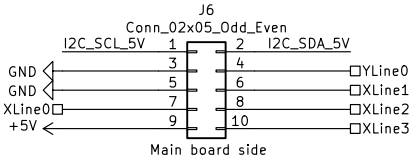


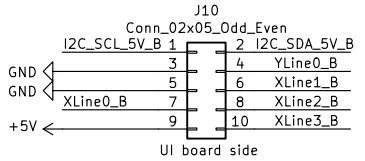


Total segement resistance 2-10k

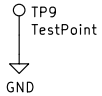
R24 YLine series resistance
adjusts for EMC susceptibility

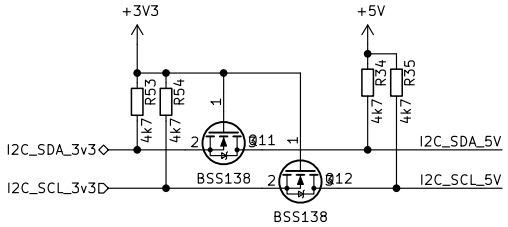
R25-28 XLine series resistance
adjusts for EMC emission





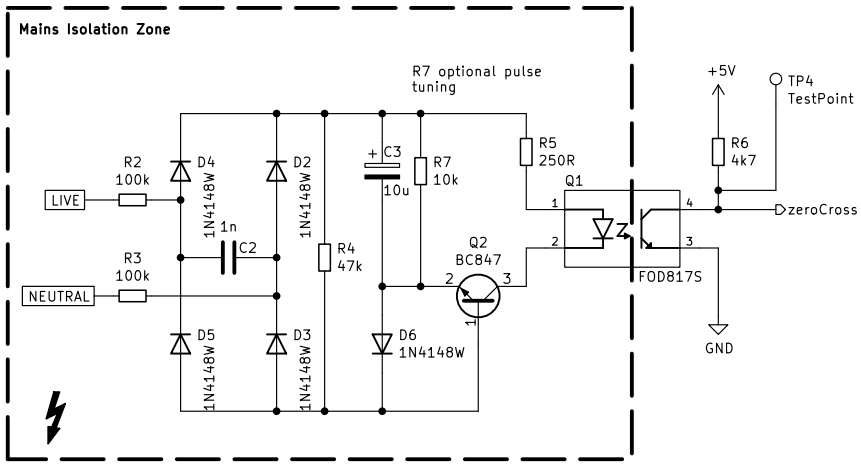
**** SMT HEADER**





Pass-transistor open drain
level translator

D.Rowntree		
Sheet: /UI/ File: SmartDesk_UI.kicad_sch		
Title: Smart Desk Main PCB		
Size: A4	Date: 2024-06-14	**Rev: 1.0**
KiCad E.D.A. 8.0.2		Id: 4/5



** Do Not Fit any parts if:
1. using AVR ZCD connection
2. Using relays for power switching

D.Rowntree		
Sheet: /ZCD/ File: SmarDesk_ZCD.kicad_sch		
Title: Smart Desk Main PCB		
Size: A4	Date: 2024-06-14	**Rev: 1.0**
KiCad E.D.A. 8.0.2		Id: 5/5