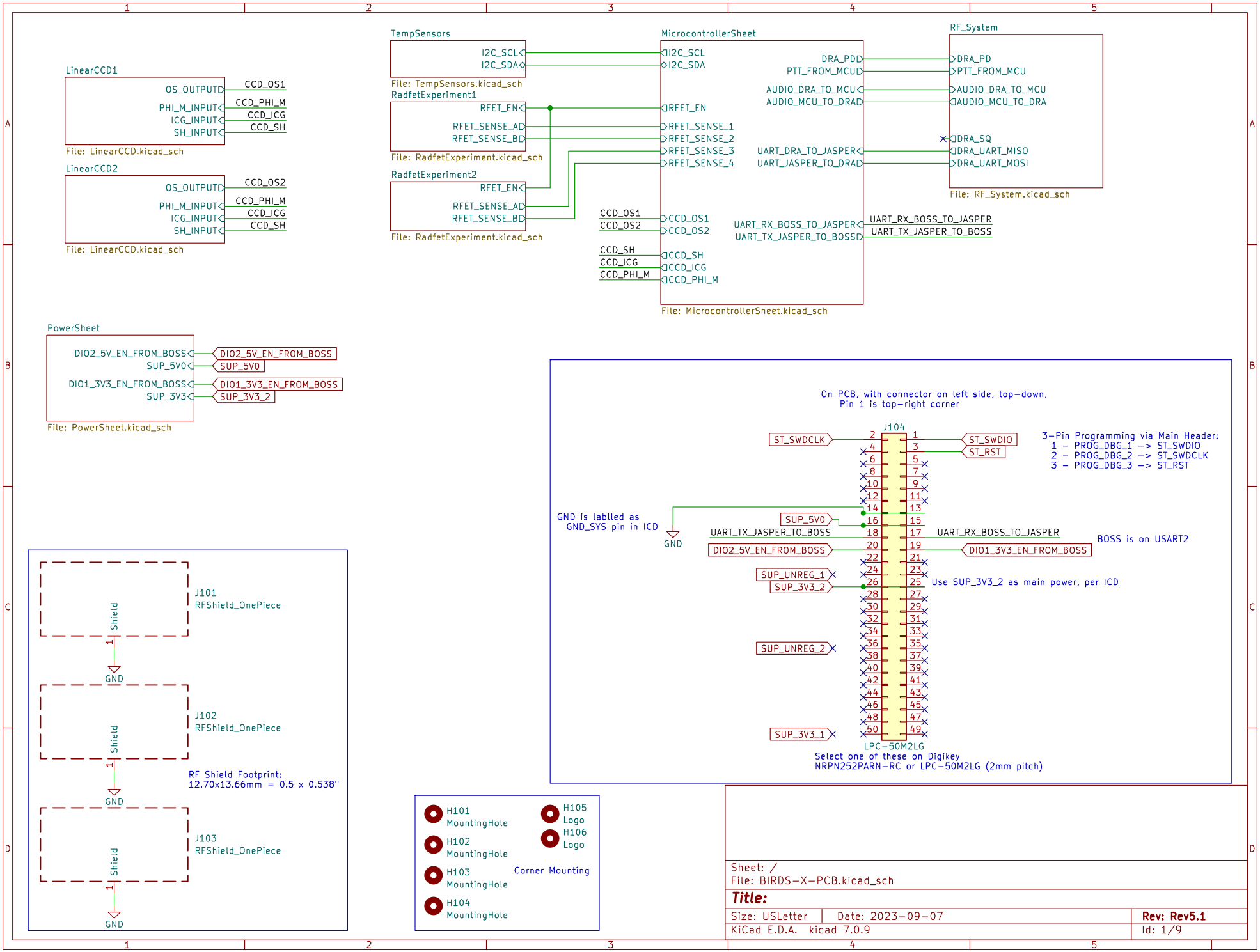
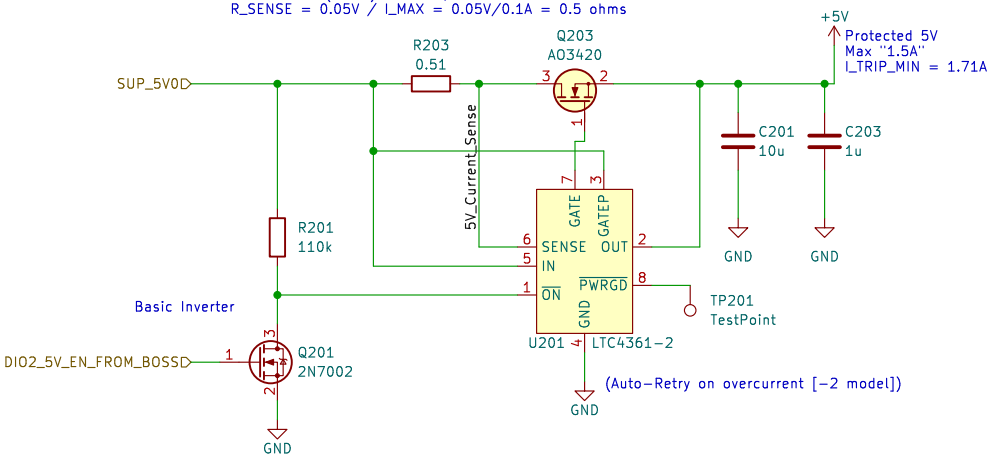
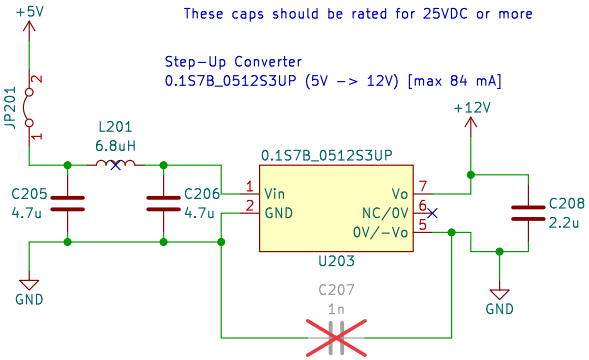

LinearCCD1
OS_OUTPUT
PHI_M_INPUT
ICG_INPUT
SH_INPUT
CCD_OS1
CCD_PHI_M
CCD_ICG
CCD_SH
File: LinearCCD.kicad_sch
LinearCCD2
OS_OUTPUT
PHI_M_INPUT
ICG_INPUT
SH_INPUT
CCD_OS2
CCD_PHI_M
CCD_ICG
CCD_SH
File: LinearCCD.kicad_sch
TempSensors
I2C_SCL
I2C_SDA
File: TempSensors.kicad_sch
RadfetExperiment1
RFET_EN
RFET_SENSE_AD
RFET_SENSE_BD
File: RadfetExperiment.kicad_sch
RadfetExperiment2
RFET_EN
RFET_SENSE_AD
RFET_SENSE_BD
File: RadfetExperiment.kicad_sch
MicrocontrollerSheet
I2C_SCL
I2C_SDA
RFET_EN
RFET_SENSE_1
RFET_SENSE_2
RFET_SENSE_3
RFET_SENSE_4
CCD_OS1
CCD_OS2
CCD_SH
CCD_ICG
CCD_PHI_M
DRA_PDD
PTT_FROM_MCU
AUDIO_DRA_TO_MCU
AUDIO_MCU_TO_DRA
UART_DRA_TO_JASPER
UART_JASPER_TO_DRA
UART_RX_BOSS_TO_JASPER
UART_TX_JASPER_TO_BOSS
File: MicrocontrollerSheet.kicad_sch
RF_System
DRA_PD
PTT_FROM_MCU
AUDIO_DRA_TO_MCU
AUDIO_MCU_TO_DRA
DRA_SQ
DRA_UART_MISO
DRA_UART_MOSI
File: RF_System.kicad_sch
UART_RX_BOSS_TO_JASPER
UART_TX_JASPER_TO_BOSS
PowerSheet
DIO2_5V_EN_FROM_BOSS
SUP_5V0
DIO1_3V3_EN_FROM_BOSS
SUP_3V3
DIO2_5V_EN_FROM_BOSS
SUP_5V0
DIO1_3V3_EN_FROM_BOSS
SUP_3V3_2
File: PowerSheet.kicad_sch
On PCB, with connector on left side, top-down,
Pin 1 is top-right corner
J104
ST_SWDCLK
ST_SWDIO
ST_RST
3-Pin Programming via Main Header:
1 - PROG_DBG_1 -> ST_SWDIO
2 - PROG_DBG_2 -> ST_SWDCLK
3 - PROG_DBG_3 -> ST_RST
GND is lablled as
GND_SYS pin in ICD
GND
SUP_5V0
UART_TX_JASPER_TO_BOSS
UART_RX_BOSS_TO_JASPER
BOSS is on USART2
DIO2_5V_EN_FROM_BOSS
DIO1_3V3_EN_FROM_BOSS
SUP_UNREG_1
SUP_3V3_2
Use SUP_3V3_2 as main power, per ICD
SUP_UNREG_2
SUP_3V3_1
LPC-50M2LG
Select one of these on Digikey
NRPN252PARN-RC or LPC-50M2LG (2mm pitch)
J101
RFShield_OnePiece
Shield
GND
J102
RFShield_OnePiece
Shield
GND
RF Shield Footprint:
12.70x13.66mm = 0.5 x 0.538"
J103
RFShield_OnePiece
Shield
GND
H101
MountingHole
H102
MountingHole
H103
MountingHole
H104
MountingHole
H105
Logo
H106
Logo
Corner Mounting
Sheet: /
File: BIRDS-X-PCB.kicad_sch
Title:
Size: USLetter
Date: 2023-09-07
Rev: Rev5.1
KiCad E.D.A. kicad 7.0.9
Id: 1/9

For the LTC4361 (per datasheet page 5):
R_SENSE = (0.05V) / I_SENSE

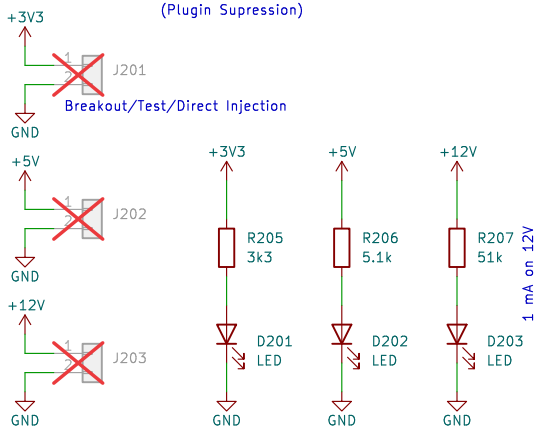
5V Current Limit:
Max Power = 0.5W (good for experiment safety)
Max Current (at 5V) = 0.5W / 5V = 0.1A
R_SENSE = 0.05V / I_MAX = 0.05V/0.1A = 0.5 ohms

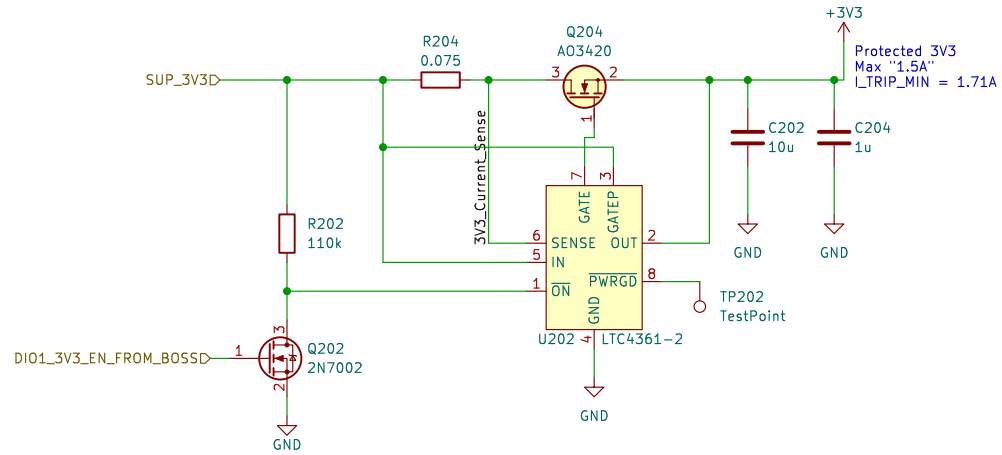


These caps should be rated for 25VDC or more



C206 should be 4kVDC
Vishay HGZ102MBP
TDK CD45-E2GA102M-GKA
(Plugin Supression)





3V3 Current Limit:
Max Power = 2W (a little over the 1.75W max)
Max Current (at 3V3) = 2W/3V3 = 0.61A
R_SENSE = 0.05V / I_MAX = 0.05V/0.61A = 0.081 ohms

0.075 ohms => 0.66A => 2.2W

Sheet: /PowerSheet/		
File: PowerSheet.kicad_sch		
Title:		
Size: USLetter	Date: 2023-09-07	**Rev: Rev5.1**
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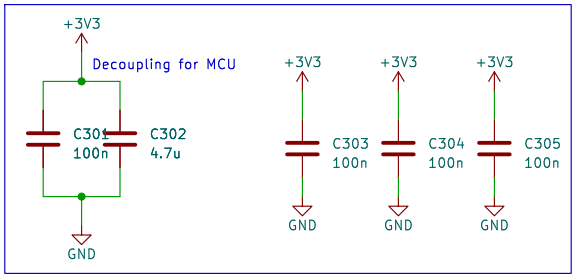
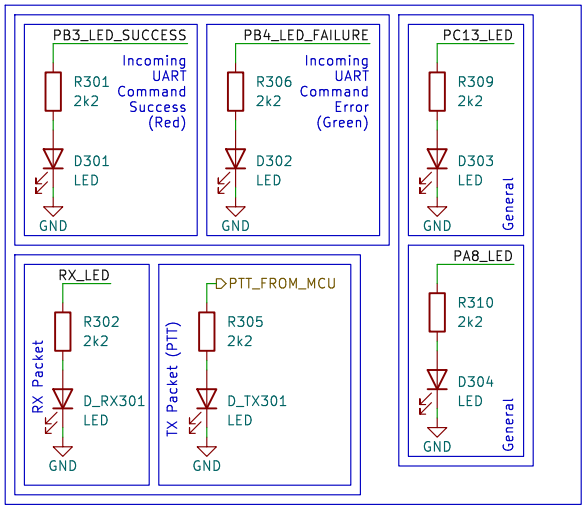
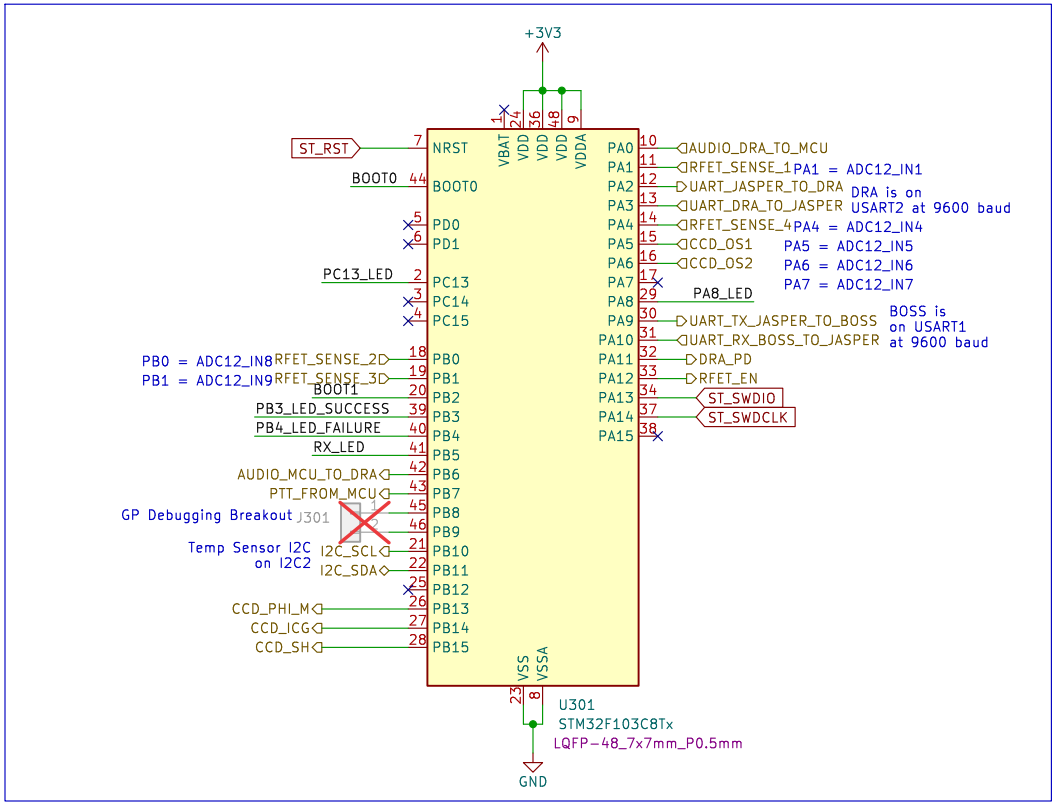


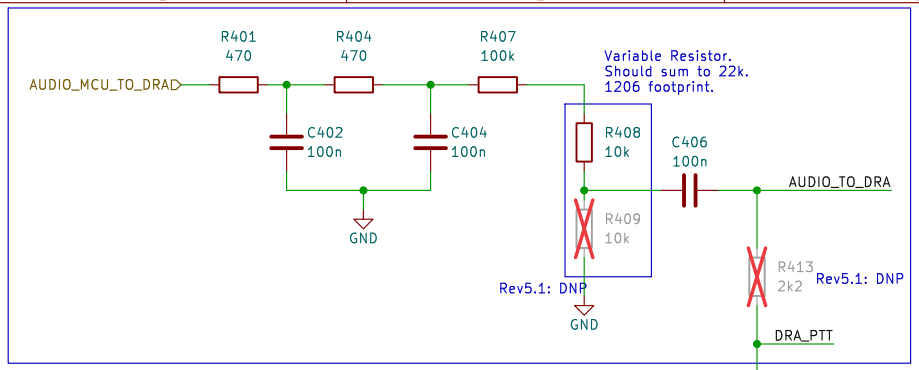
NOTE: Red is used to indicate success,
and green is used to indicate failure.

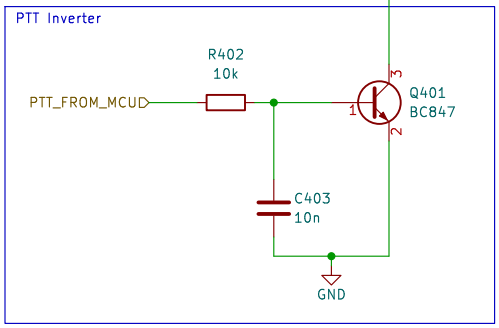


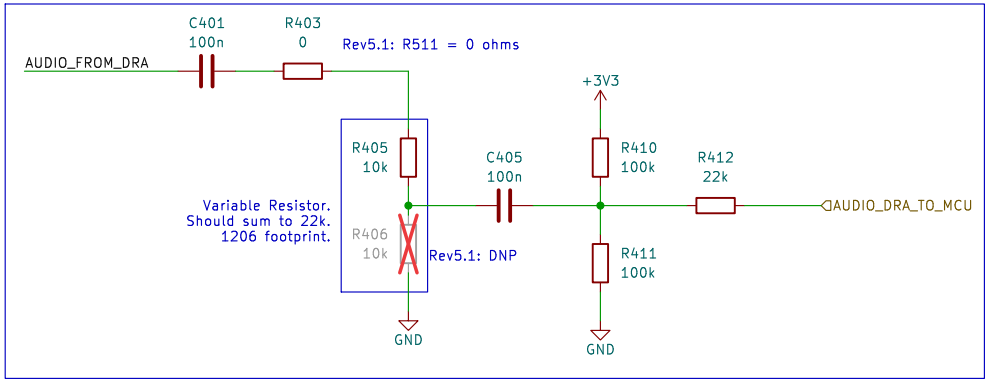


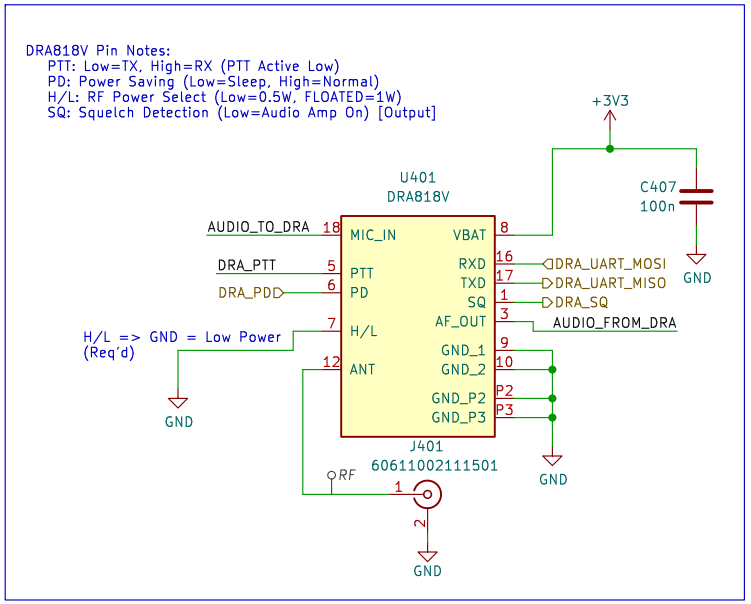
Sheet: /MicrocontrollerSheet/	
File: MicrocontrollerSheet.kicad_sch	
Title:	
Size: USLetter	Date: 2023-09-07
KiCad E.D.A. kicad 7.0.9	Id: 3/9

Rev: Rev5.1





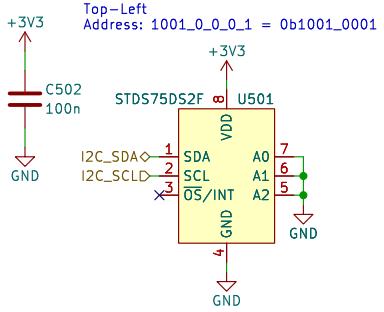




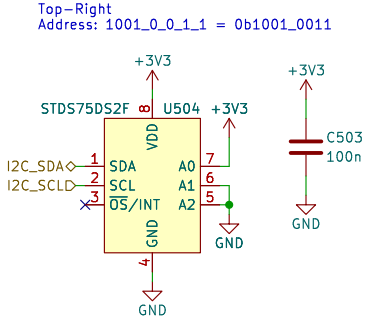
Sheet: /RF_System/		
File: RF_System.kicad_sch		
Title:		
Size: USLetter	Date: 2023-09-07	**Rev: Rev5.1**
KiCad E.D.A. kicad 7.0.9		Id: 4/9

Address: 1001_A2_A1_A0_R/W
When R/W=1, READ mode

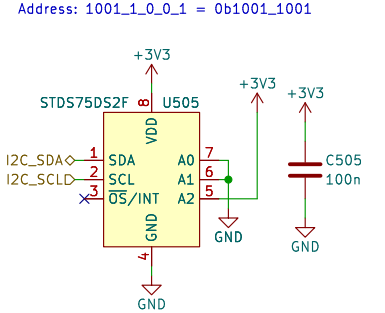
Top-Left
Address: 1001_0_0_0_1 = 0b1001_0001



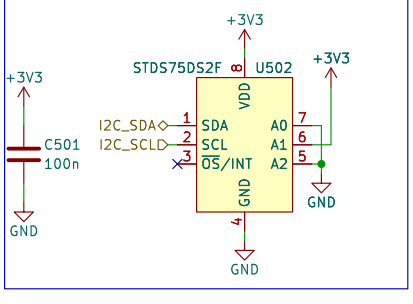
Top-Right
Address: 1001_0_0_1_1 = 0b1001_0011



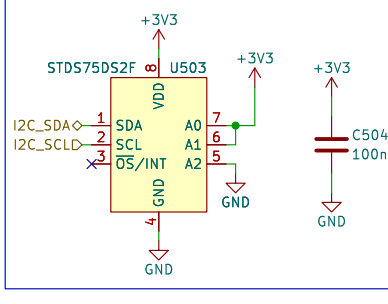
Center
Address: 1001_1_0_0_1 = 0b1001_1001



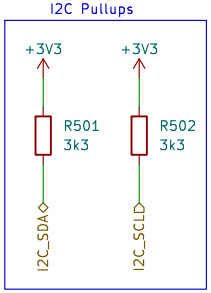
Bottom-Left
Address: 1001_0_1_0_1 = 0b1001_0101



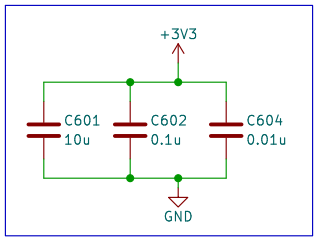
Bottom-Right
Address: 1001_0_1_1_1 = 0b1001_0111

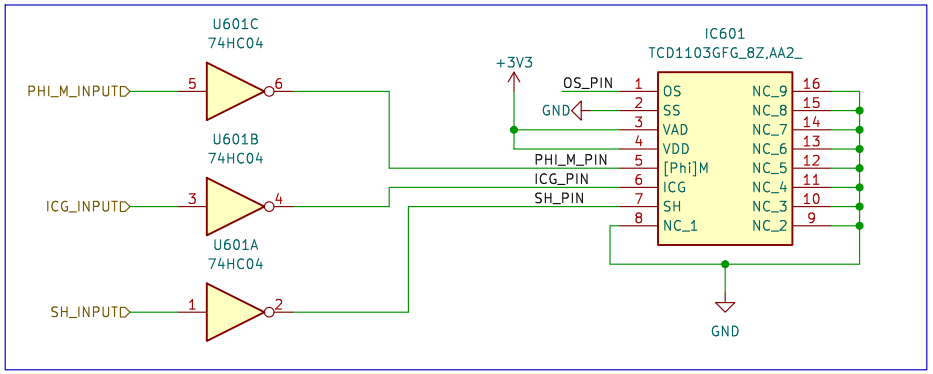


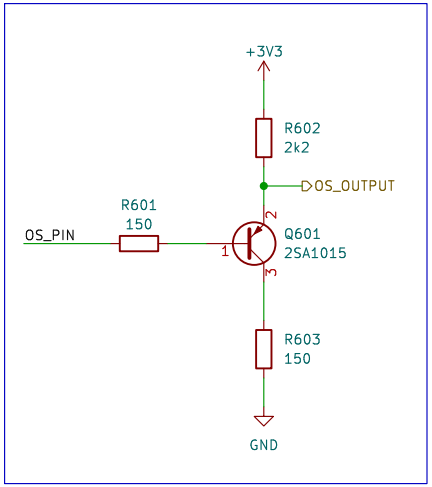
I2C Pullups

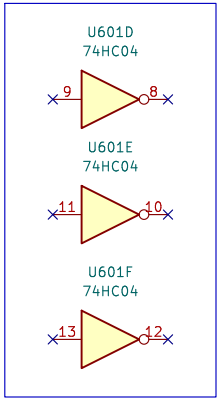


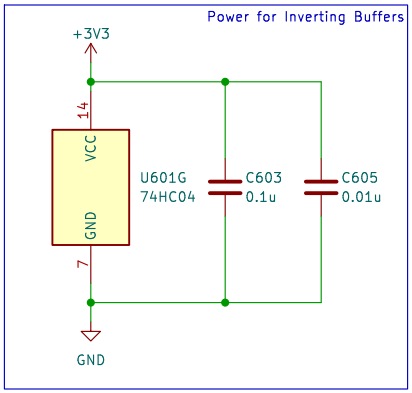
Sheet: /TempSensors/		
File: TempSensors.kicad_sch		
Title:		
Size: USLetter	Date: 2023-09-07	**Rev: Rev5.1**
KiCad E.D.A. kicad 7.0.9		Id: 5/9







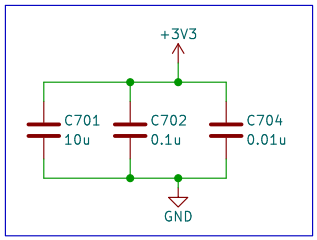


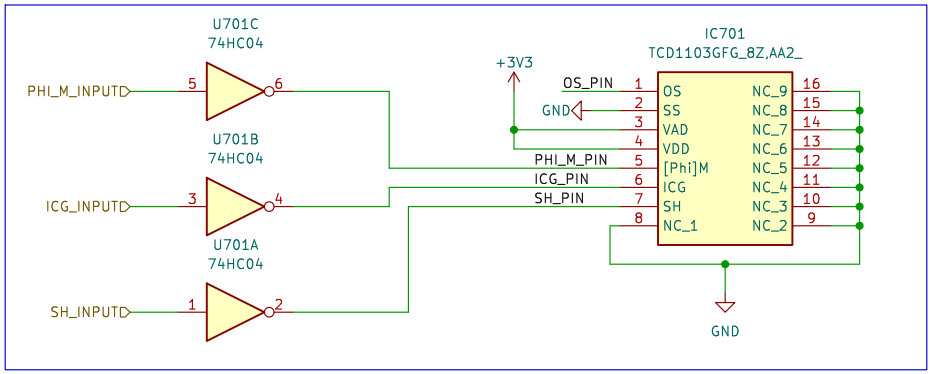


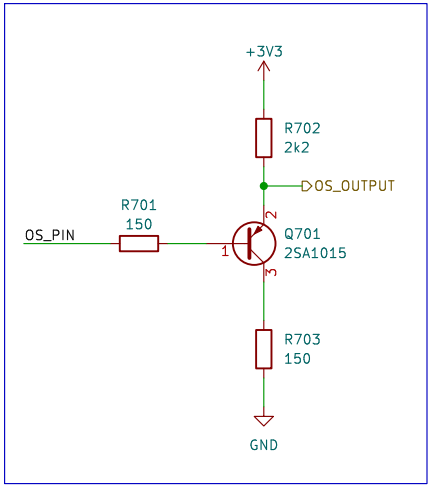
Sheet: /LinearCCD1/
File: LinearCCD.kicad_sch

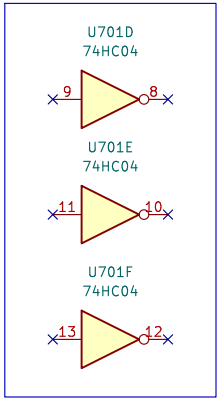
Title:

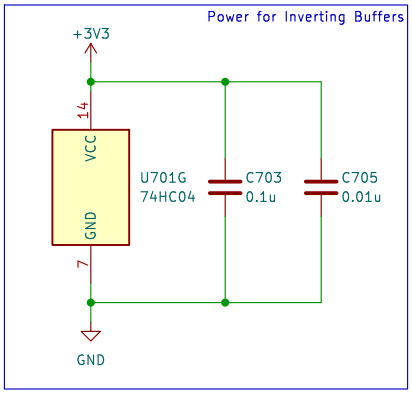
Size: USLetter	Date:	**Rev:**
KiCad E.D.A. kicad 7.0.9		Id: 6/9







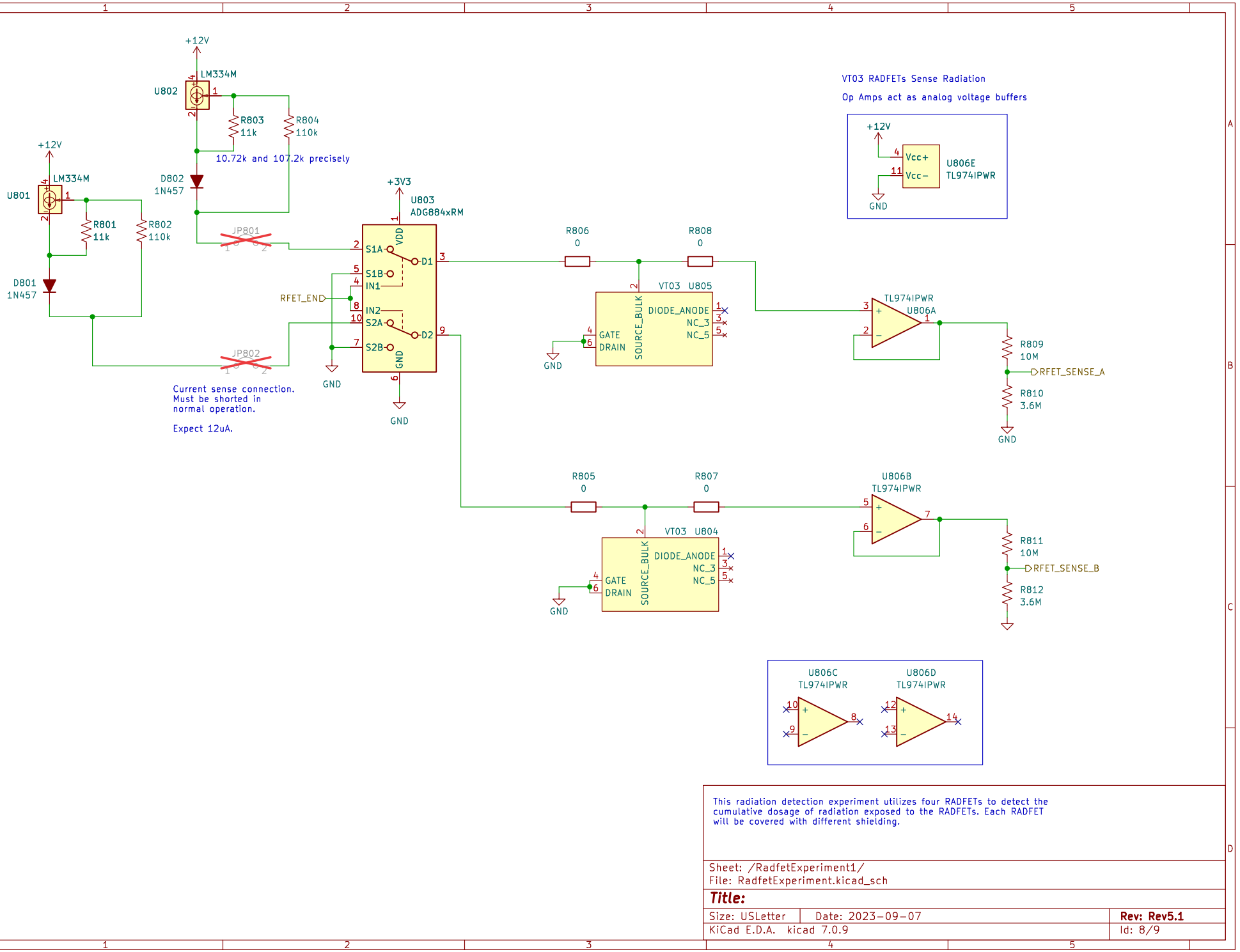


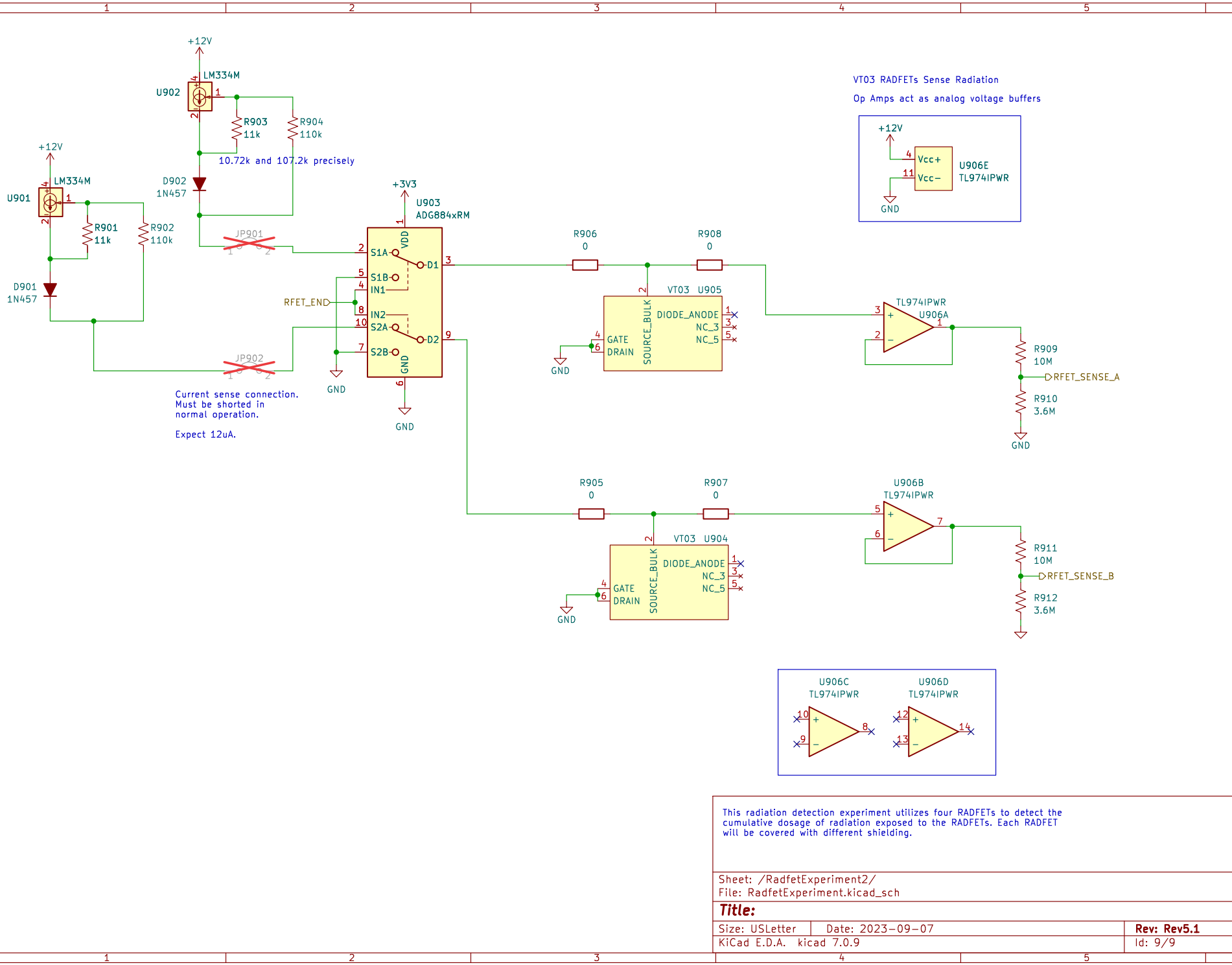


Sheet: /LinearCCD2/
File: LinearCCD.kicad_sch

Title:

Size: USLetter	Date:	**Rev:**
KiCad E.D.A. kicad 7.0.9		Id: 7/9


VT03 RADFETs Sense Radiation
Op Amps act as analog voltage buffers
+12V
LM334M
U802
R803
11k
R804
110k
10.72k and 107.2k precisely
D802
1N457
U801
R801
11k
R802
110k
D801
1N457
JP801
JP802
+3V3
U803
ADG884xRM
VDD
S1A
S1B
IN1
IN2
S2A
S2B
D1
D2
GND
RFET_END
Current sense connection.
Must be shorted in
normal operation.
Expect 12uA.
R806
0
R808
0
R805
0
R807
0
VT03 U805
VT03 U804
DIODE_ANODE
NC_3
NC_5
GATE
DRAIN
SOURCE_BULK
U806E
TL974IPWR
Vcc+
Vcc−
U806A
U806B
U806C
U806D
R809
10M
R810
3.6M
R811
10M
R812
3.6M
RFET_SENSE_A
RFET_SENSE_B
This radiation detection experiment utilizes four RADFETs to detect the cumulative dosage of radiation exposed to the RADFETs. Each RADFET will be covered with different shielding.
Sheet: /RadfetExperiment1/
File: RadfetExperiment.kicad_sch
Title:
Size: USLetter
Date: 2023-09-07
Rev: Rev5.1
KiCad E.D.A. kicad 7.0.9
Id: 8/9


VT03 RADFETs Sense Radiation
Op Amps act as analog voltage buffers
+12V
LM334M
U902
R903
11k
R904
110k
10.72k and 107.2k precisely
D902
1N457
U901
R901
11k
R902
110k
D901
1N457
JP901
JP902
Current sense connection.
Must be shorted in
normal operation.
Expect 12uA.
+3V3
U903
ADG884xRM
VDD
S1A
S1B
IN1
IN2
S2A
S2B
D1
D2
GND
RFET_END
R906
0
R908
0
R905
0
R907
0
VT03 U905
VT03 U904
DIODE_ANODE
NC_3
NC_5
GATE
DRAIN
SOURCE_BULK
U906E
TL974IPWR
Vcc+
Vcc−
U906A
U906B
U906C
U906D
R909
10M
R910
3.6M
R911
10M
R912
3.6M
RFET_SENSE_A
RFET_SENSE_B
This radiation detection experiment utilizes four RADFETs to detect the cumulative dosage of radiation exposed to the RADFETs. Each RADFET will be covered with different shielding.
Sheet: /RadfetExperiment2/
File: RadfetExperiment.kicad_sch
Title:
Size: USLetter
Date: 2023-09-07
Rev: Rev5.1
KiCad E.D.A. kicad 7.0.9
Id: 9/9