

6

5

4

3

2

1

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

D

D

C

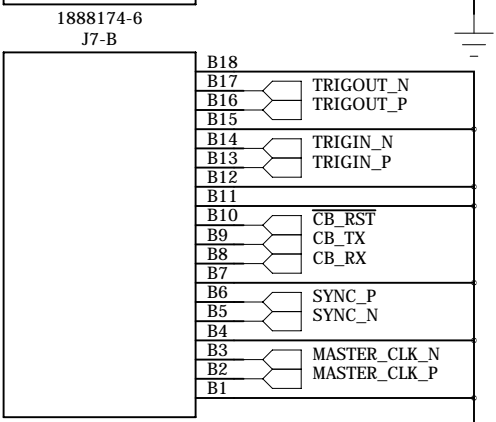
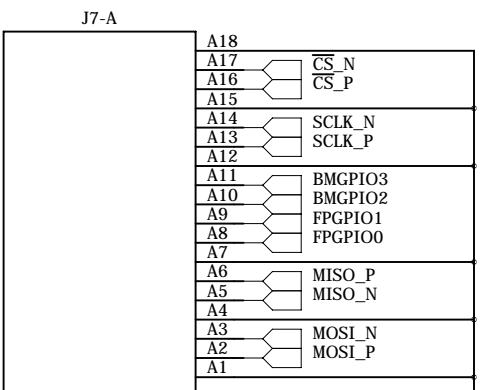
C

B

B

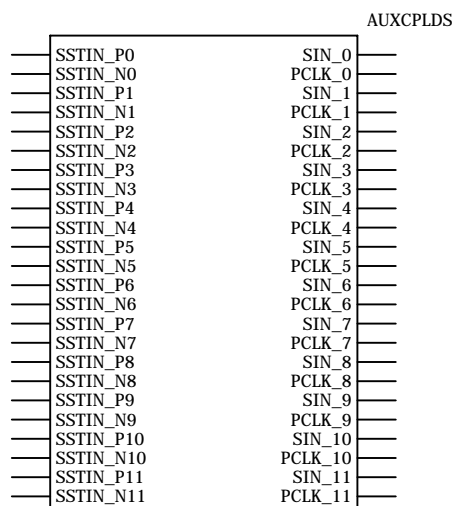
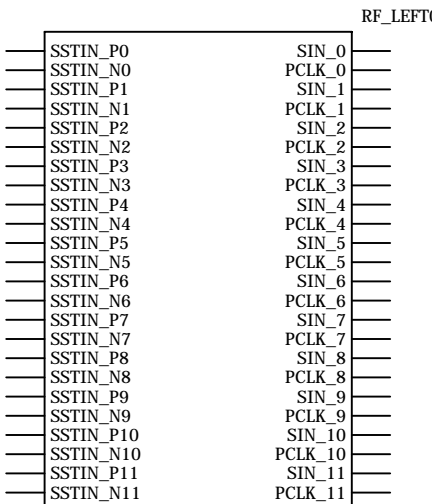
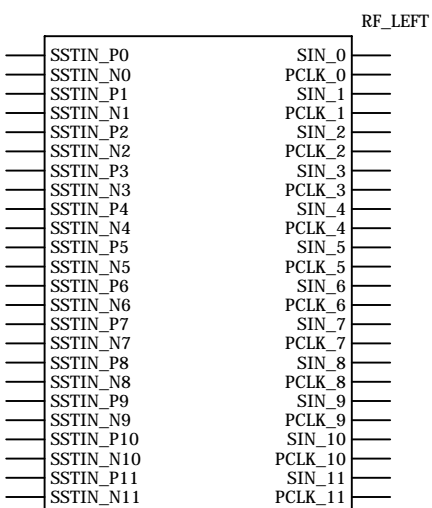
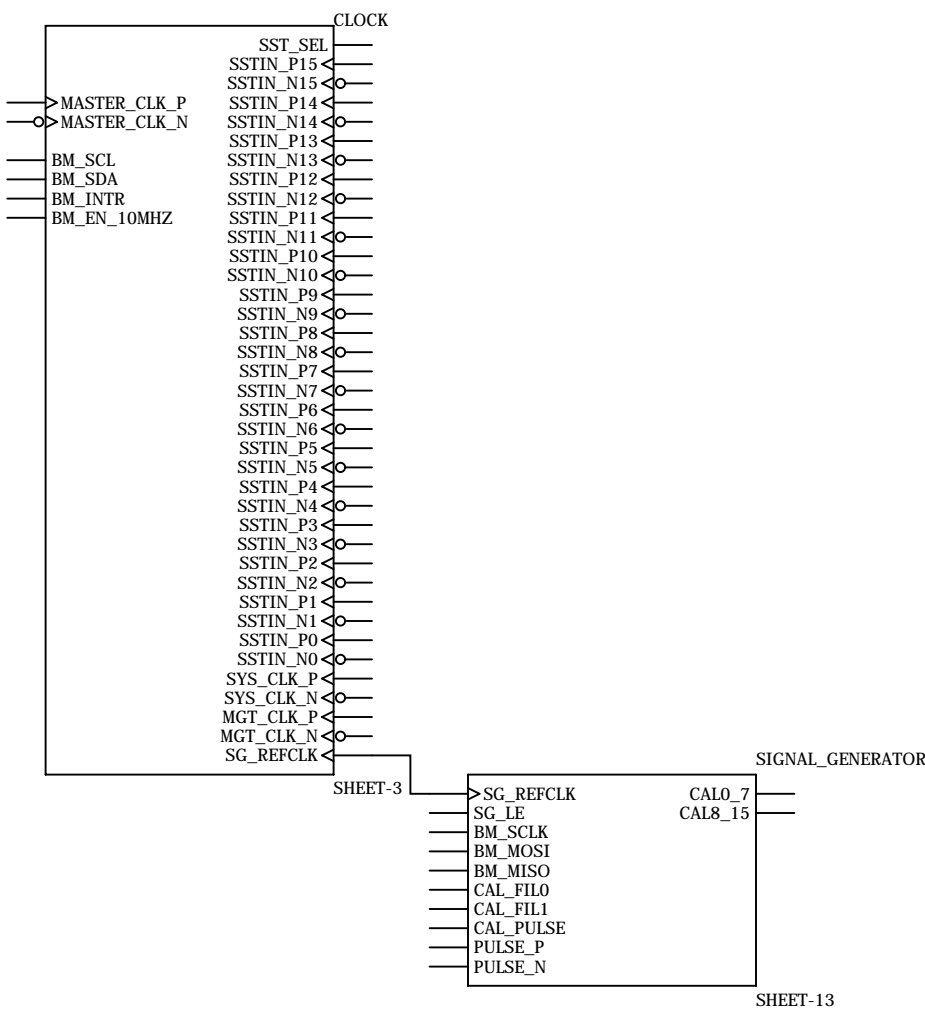
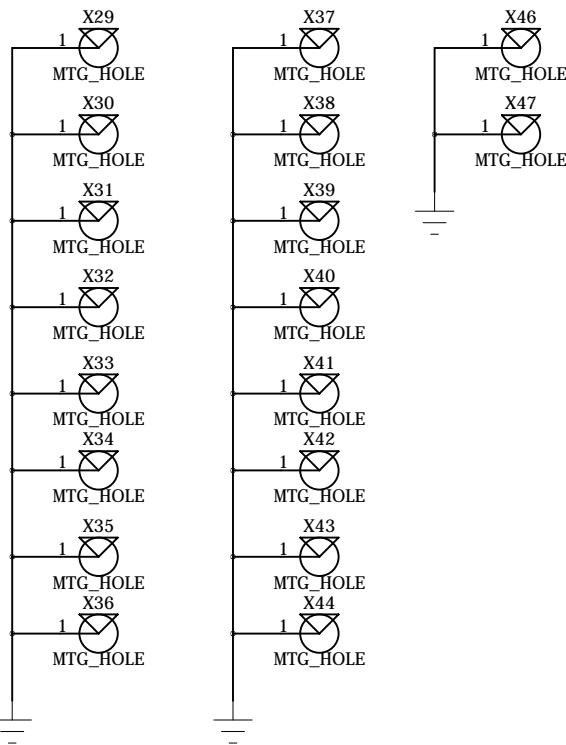
A

A



SFF-8087 connector
Cable is designed with 8 differential pairs
TRIGIN+/-
TRIGOUT+/-
CLK+/-
SYNC+/-
MOSI/GND
MISO/GND (these are implemented as differential pairs!)
SCLK/GND (allows for a higher-speed FPGA-to-FPGA link)
CS/GND (if used single ended, just drive N side to ground in FPGA)
There are also 8 sideband signals
RX/TX/RST/GND/GPIO[3:0]

At some point I'll finish a top block diagram...



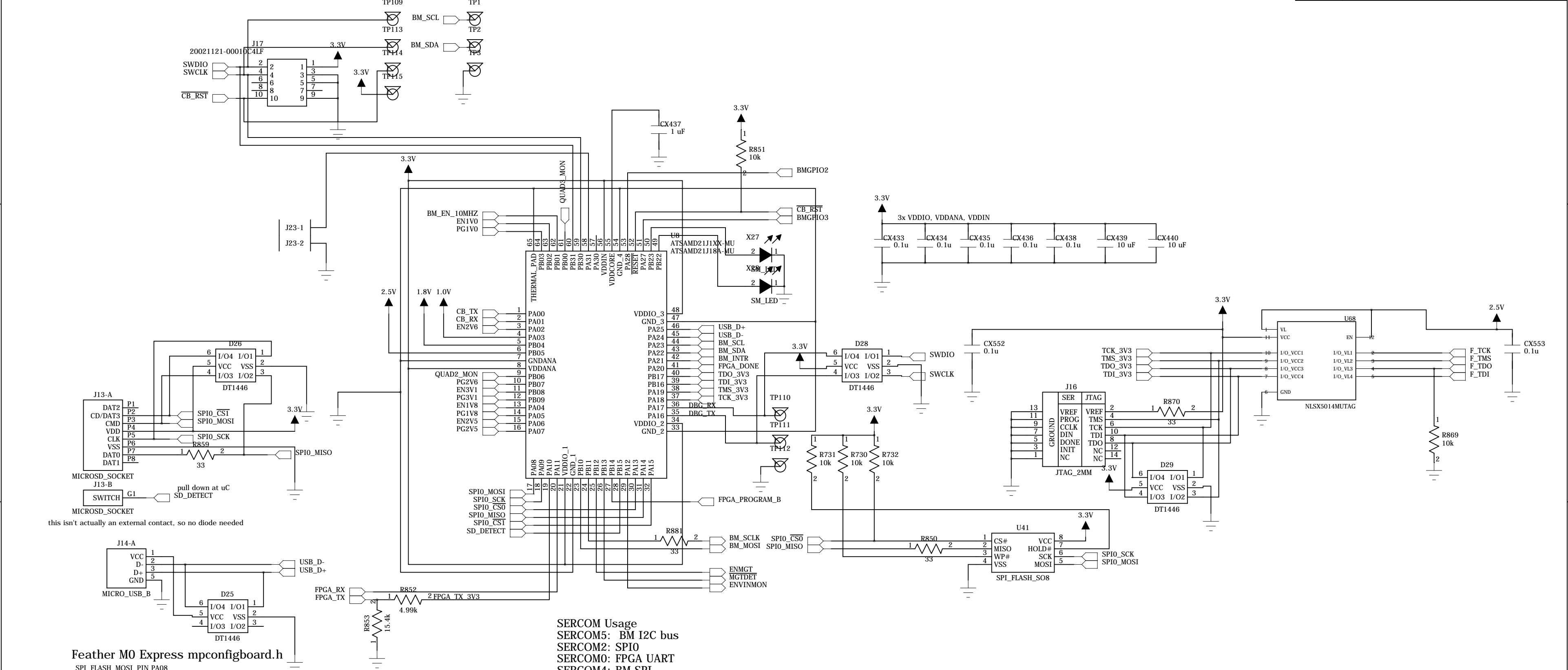
SHEET-41

SHEET-18

SHEET-42

| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: TOP | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 1 of 74 | |

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |



Feather M0 Express mpconfigboard.h

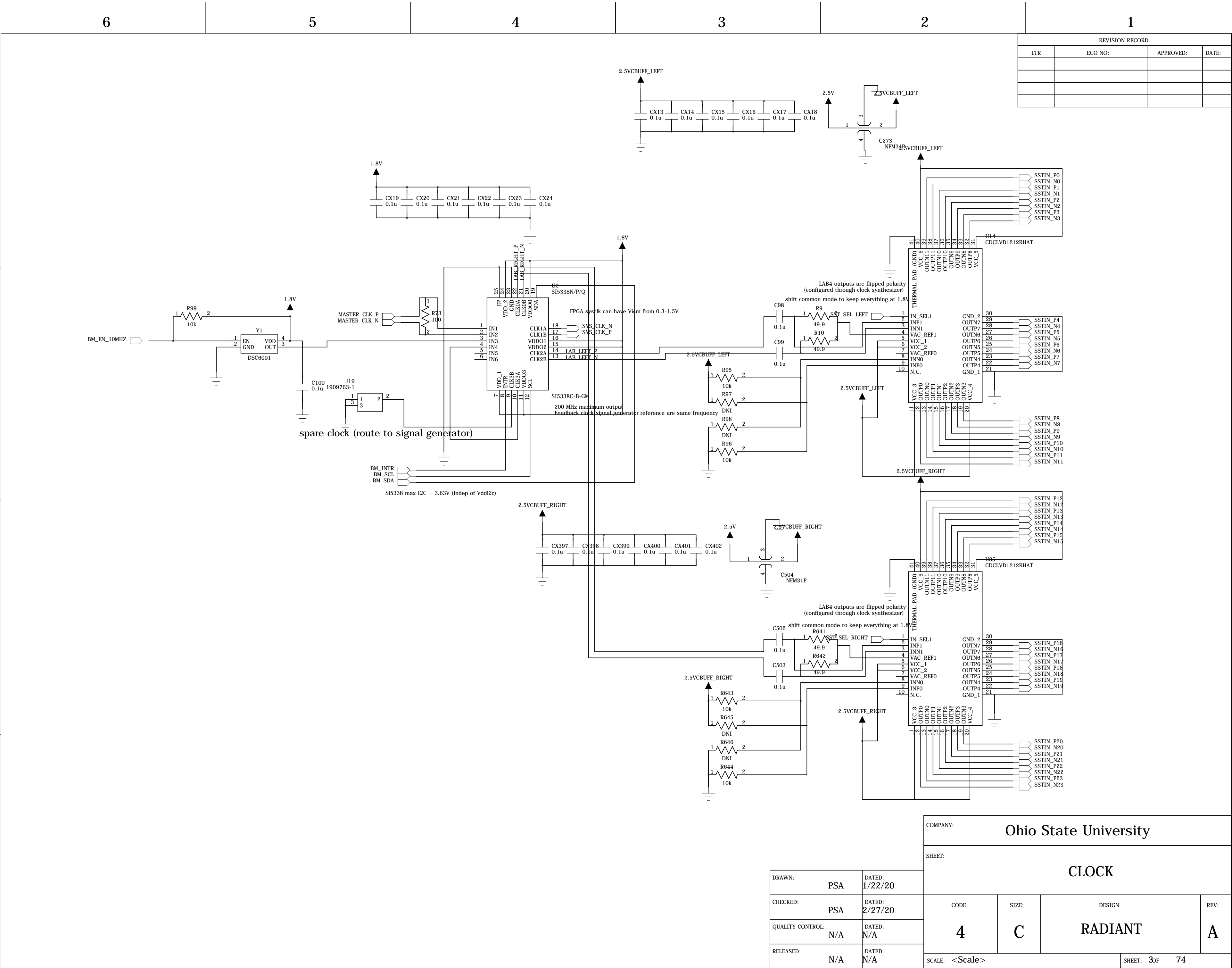
SPI_FLASH_MOSI_PIN PA08
SPI_FLASH_MISO_PIN PA14
SPI_FLASH_SCK_PIN PA09
SPI_FLASH_CS_PIN PA13
DEFAULT_I2C_BUS_SCL PA23
DEFAULT_I2C_BUS_SDA PA22
DEFAULT_SPI_BUS_SCK PB11
DEFAULT_SPI_BUS_MOSI PB10
DEFAULT_SPI_BUS_MISO PA12
DEFAULT_UART_BUS_RX PA11
DEFAULT_UART_BUS_TX PA10

Note that the default UART goes to the FPGA

SERCOM Usage
SERCOM5: BM I2C bus
SERCOM2: SPI0
SERCOM0: FPGA UART
SERCOM4: BM SPI
SERCOM3: Debug UART
SERCOM1: CB UART

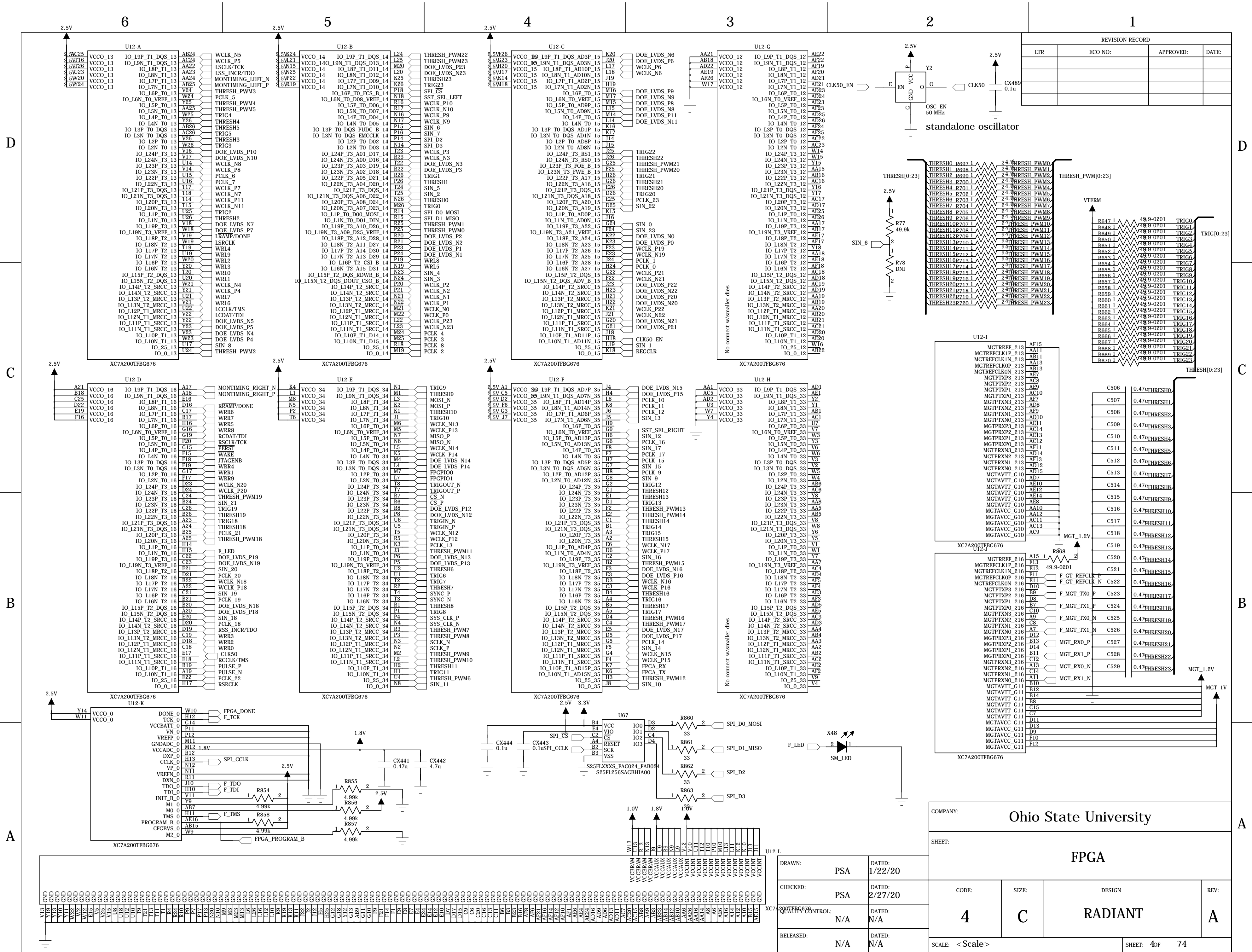
| | | | |
|--------------------------------|-------|---------|-----------------|
| COMPANY: Ohio State University | | | |
| SHEET: BOARD_MANAGER | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 20 of 74 |

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |



| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|----------------|-----------------|----------------|
| COMPANY: Ohio State University | | | |
| SHEET: CLOCK | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | |
| CHECKED: PSA | DATED: 2/27/20 | SIZE: C | |
| QUALITY CONTROL: N/A | DATED: N/A | DESIGN: RADIANT | |
| RELEASED: N/A | DATED: N/A | REV: A | |
| SCALE: <Scale> | | | SHEET: 3 of 74 |

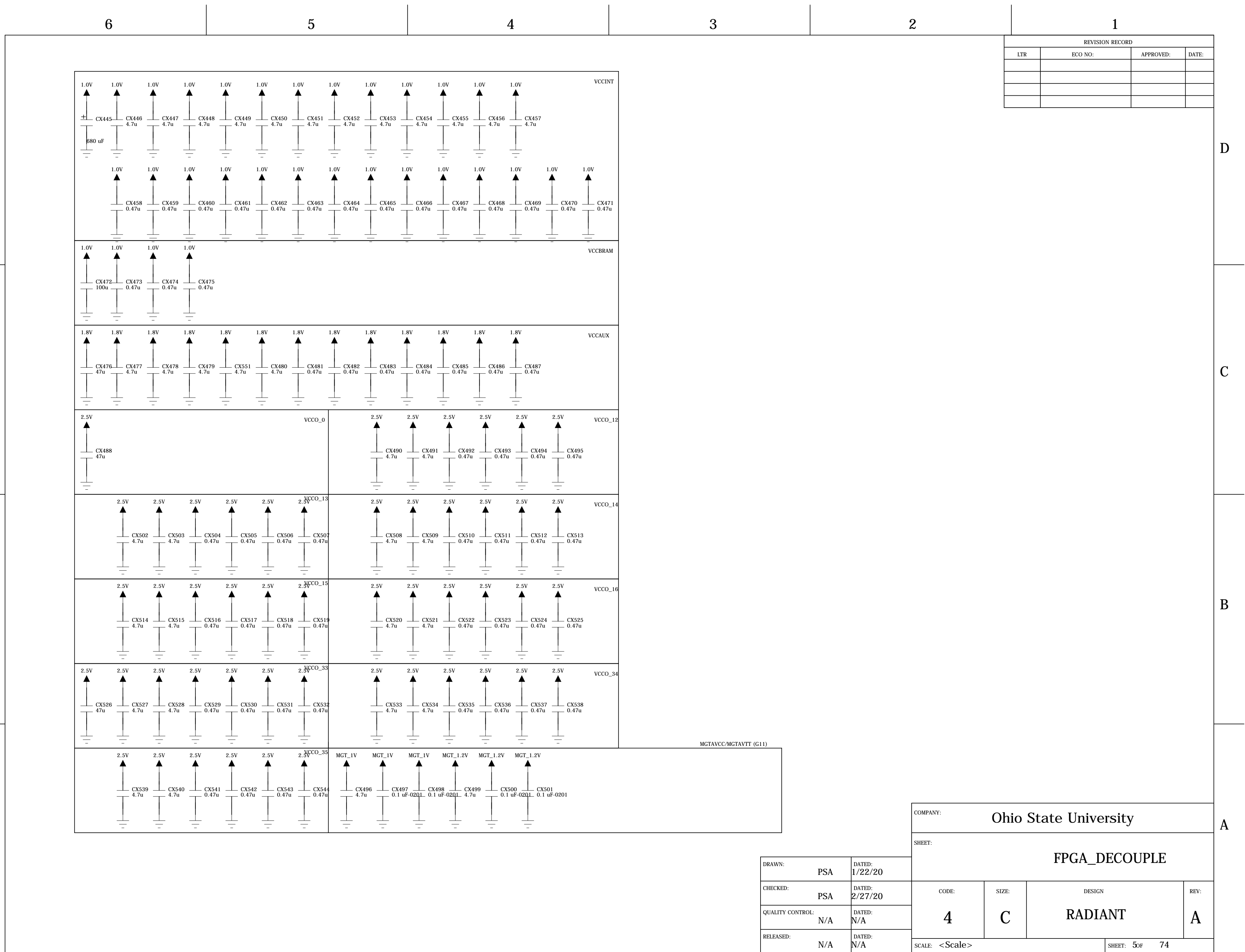


COMPANY: Ohio State University

FPGA

RADIANT

| | | | |
|----------------|-------|-----------------------|------|
| COMPANY: | | Ohio State University | |
| SHEET: | | | |
| FPGA | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | SHEET: 4 OF 74 | |



6

5

4

3

2

1

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

D

D

C

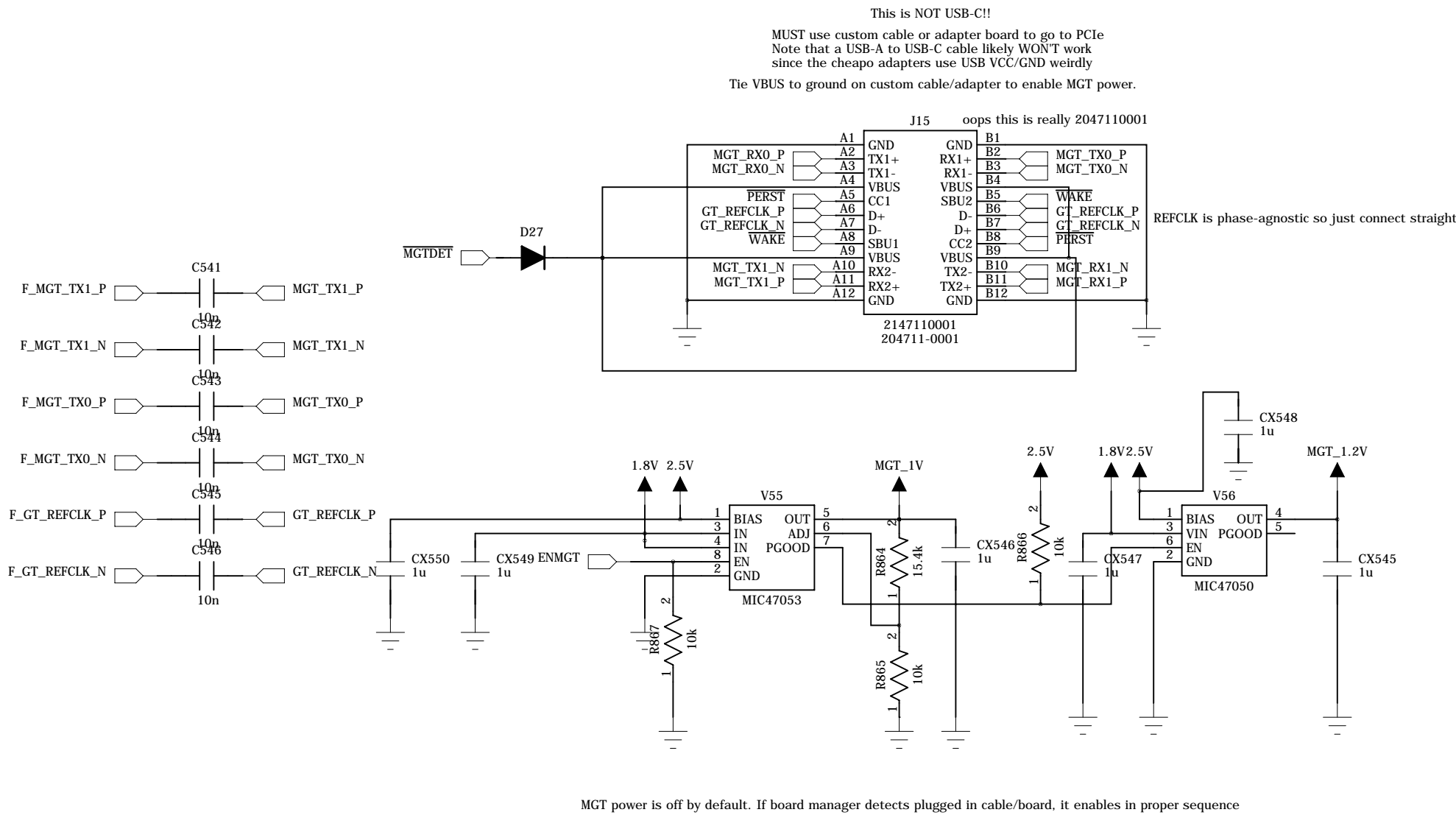
C

B

B

A

A



| | | | |
|--------------------------------|-------|---------|----------------|
| COMPANY: Ohio State University | | | |
| SHEET: FPGA-PCIE | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 6 of 74 |

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

6

5

4

3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |

D

D

C

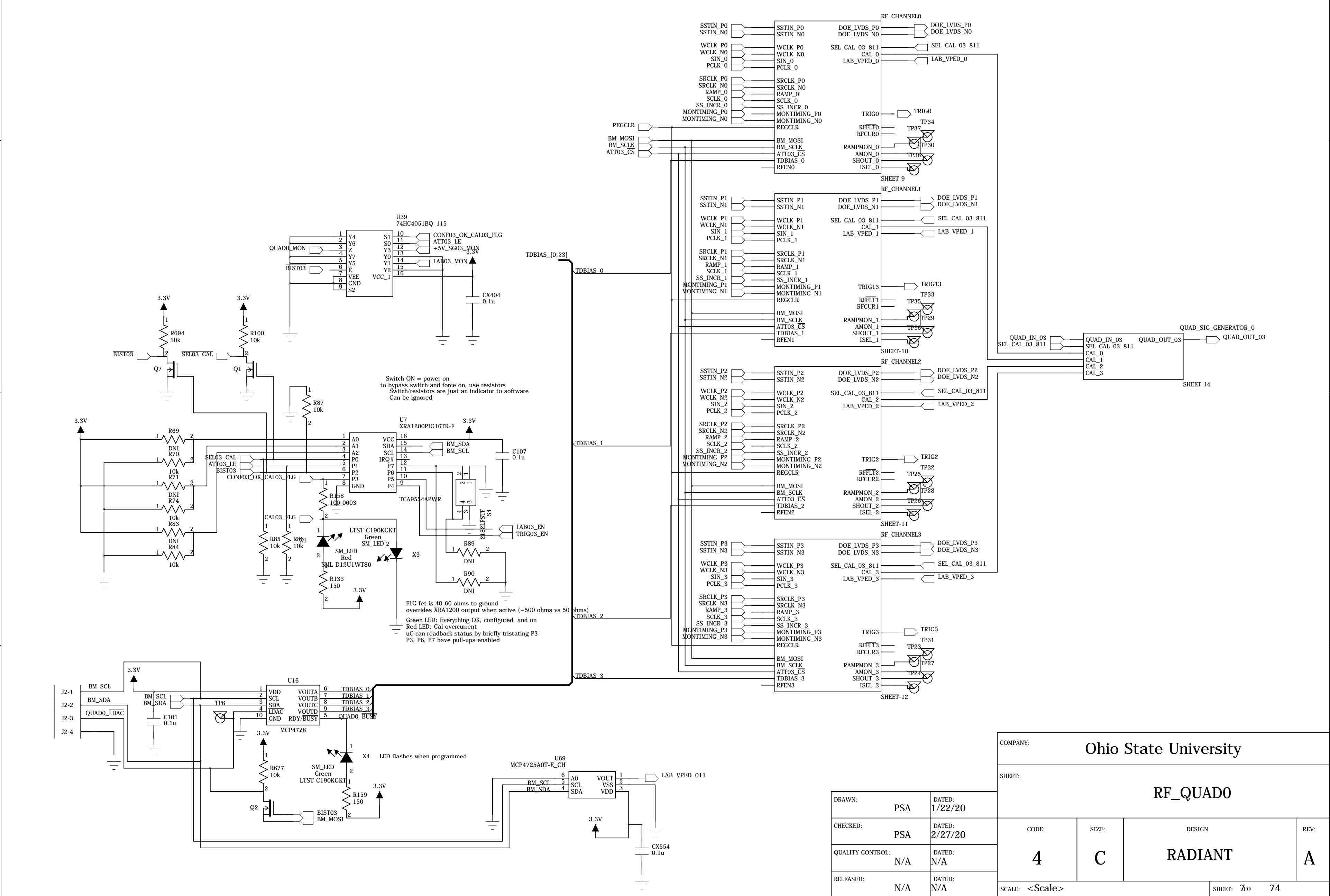
C

B

B

A

A



6

5

4

3

2

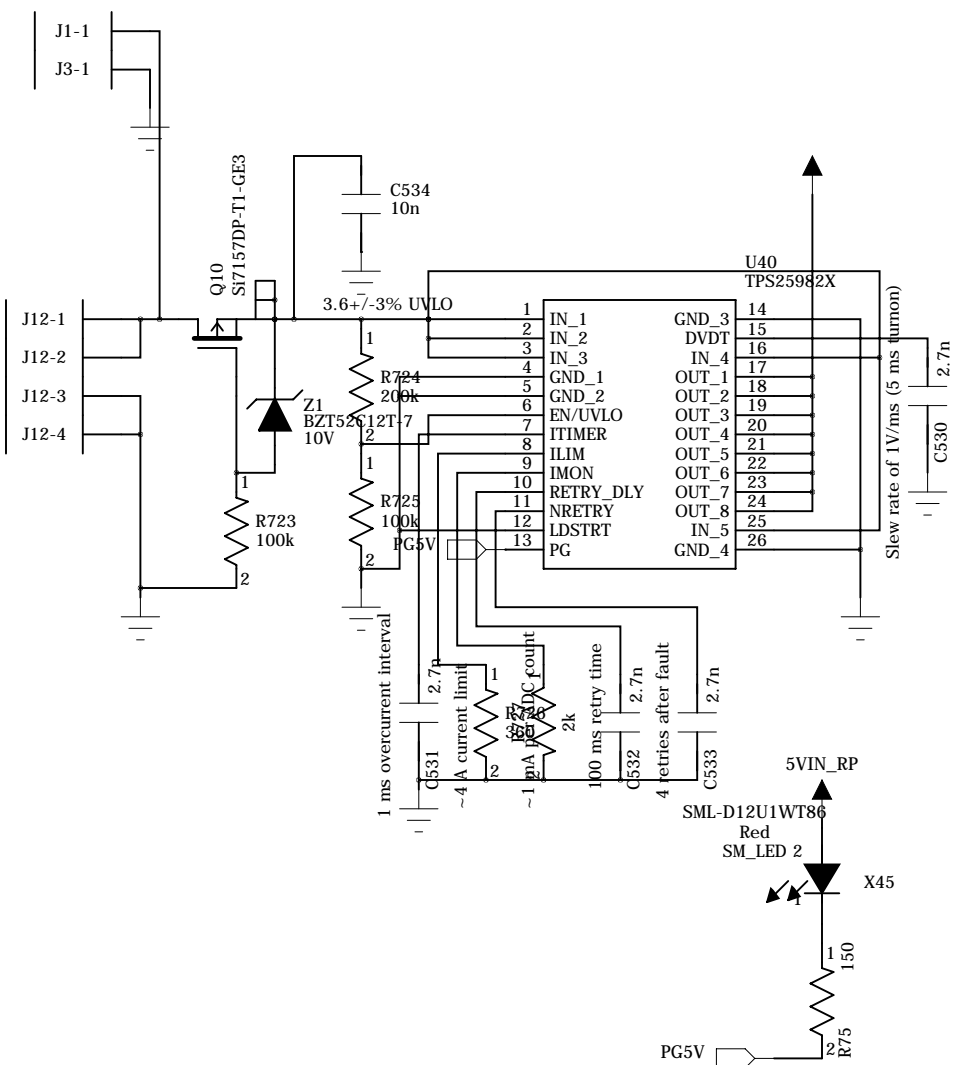
1

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |

D

D

Input power protection



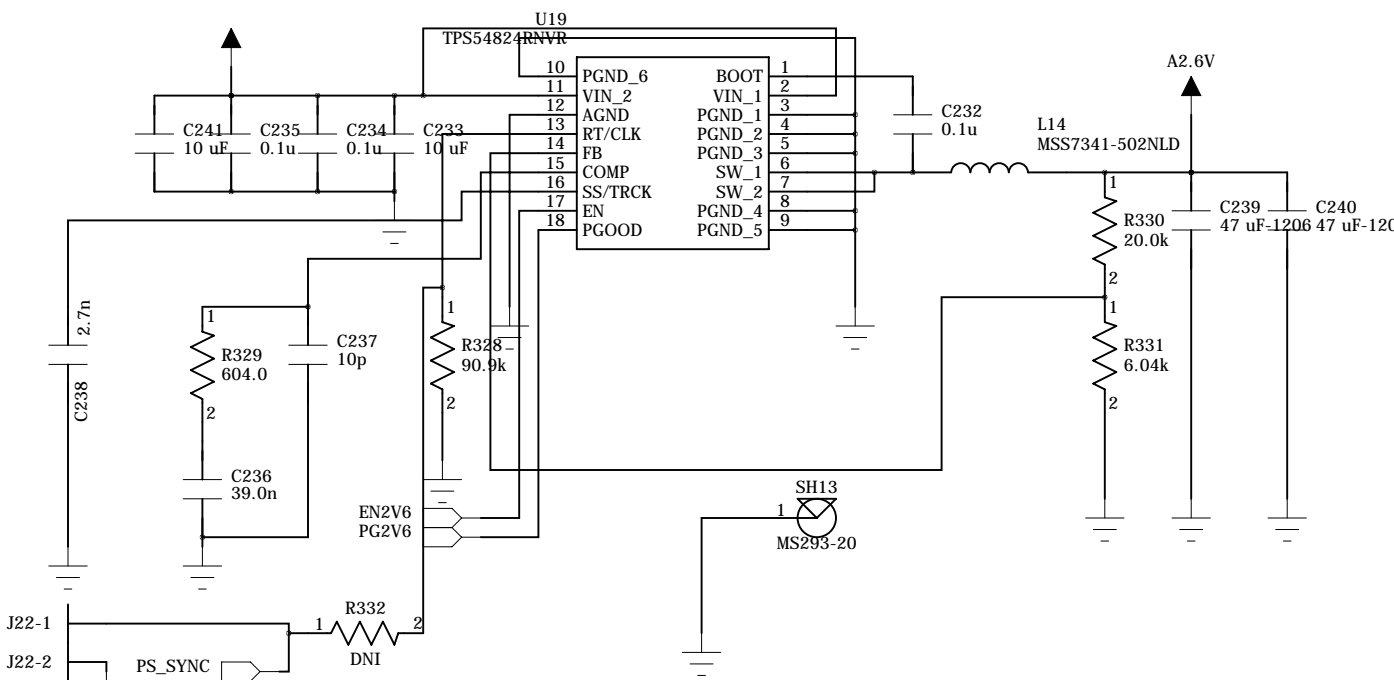
C

C

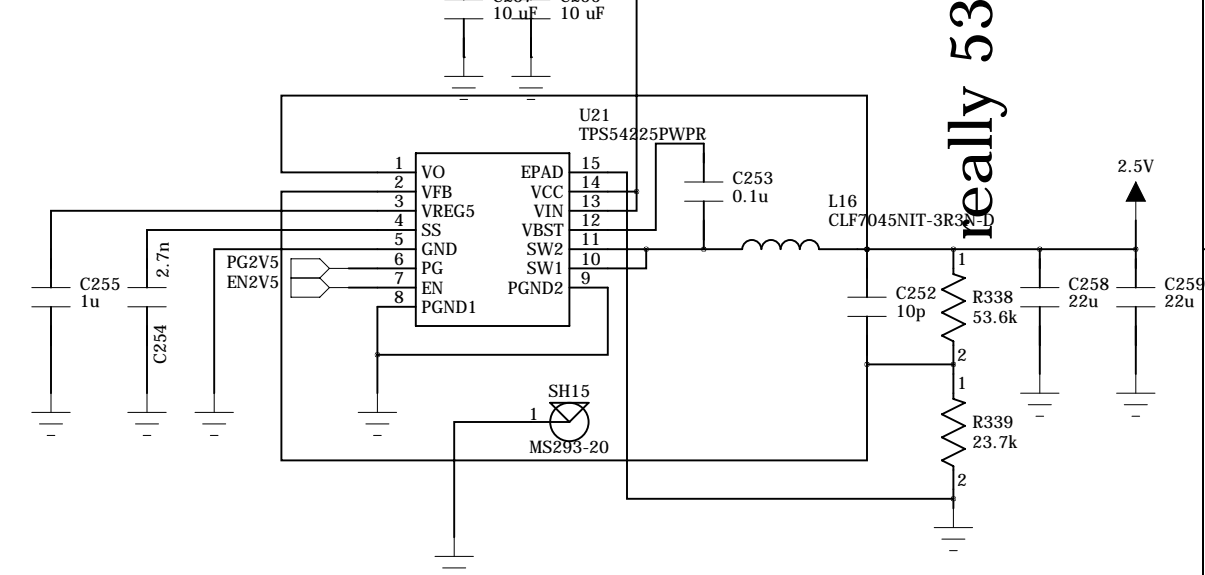
B

B

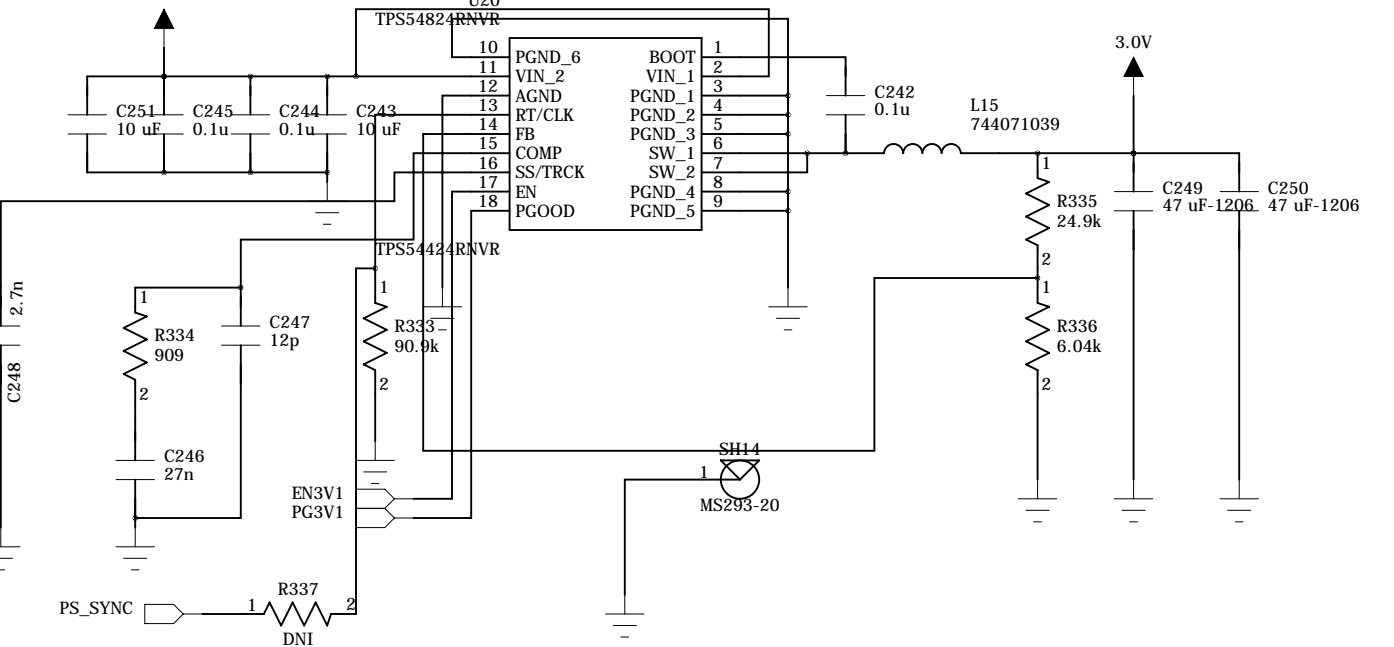
LAB4D supply (2.6V, regulated to 2.5V)



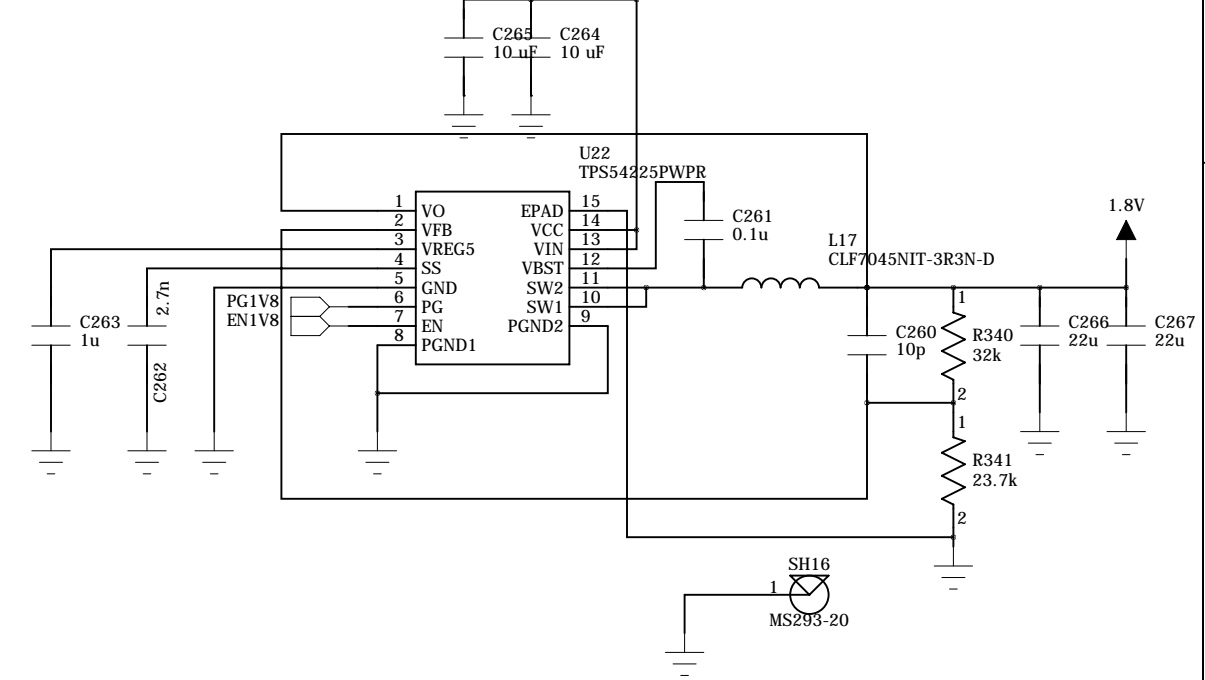
2.5V supply



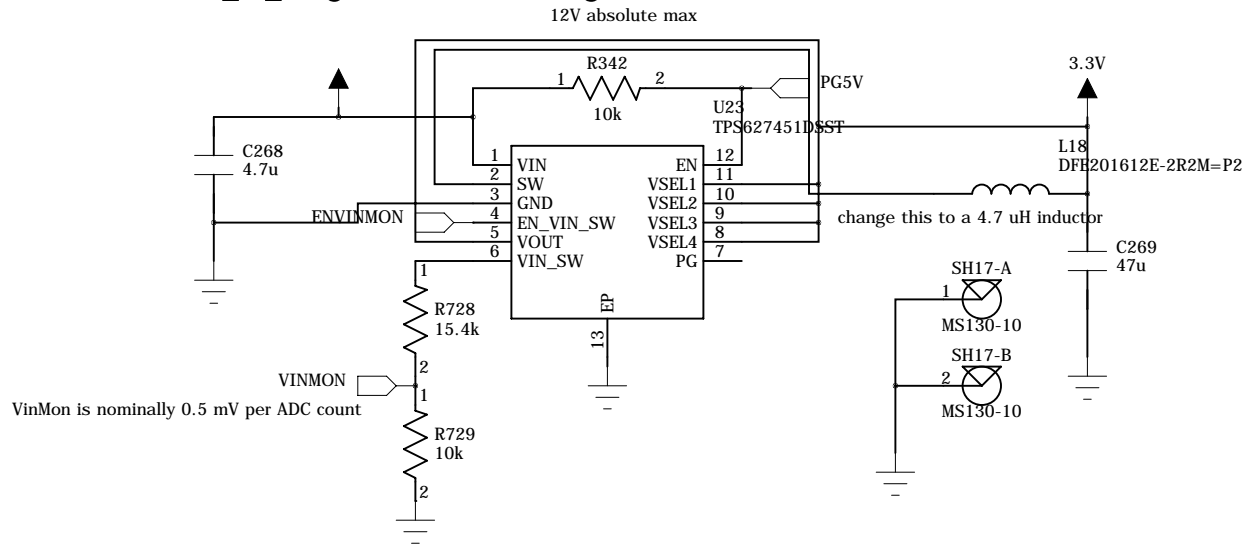
Trigger supply (3.07V, regulated to 3.0V)



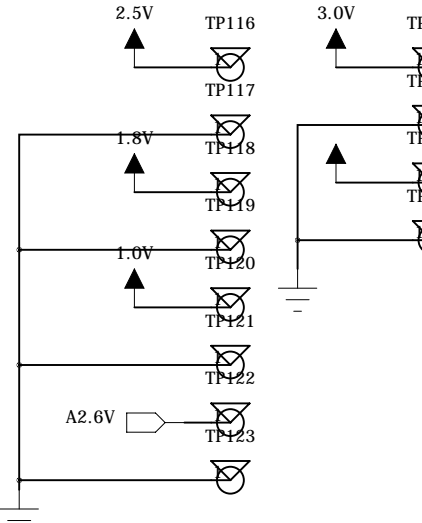
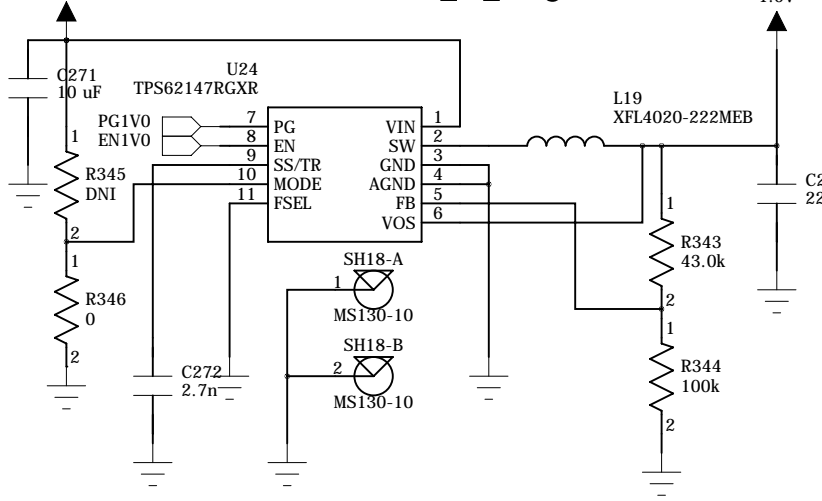
1.8V supply



3.3V supply (always on)



FPGA core supply (1.0V)



A

A

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|--------------------------------|---------|-----------------|----------------|
| COMPANY: Ohio State University | | | |
| SHEET: POWER | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 8 of 74 |

6

5

4

3

2

1

D

C

B

A

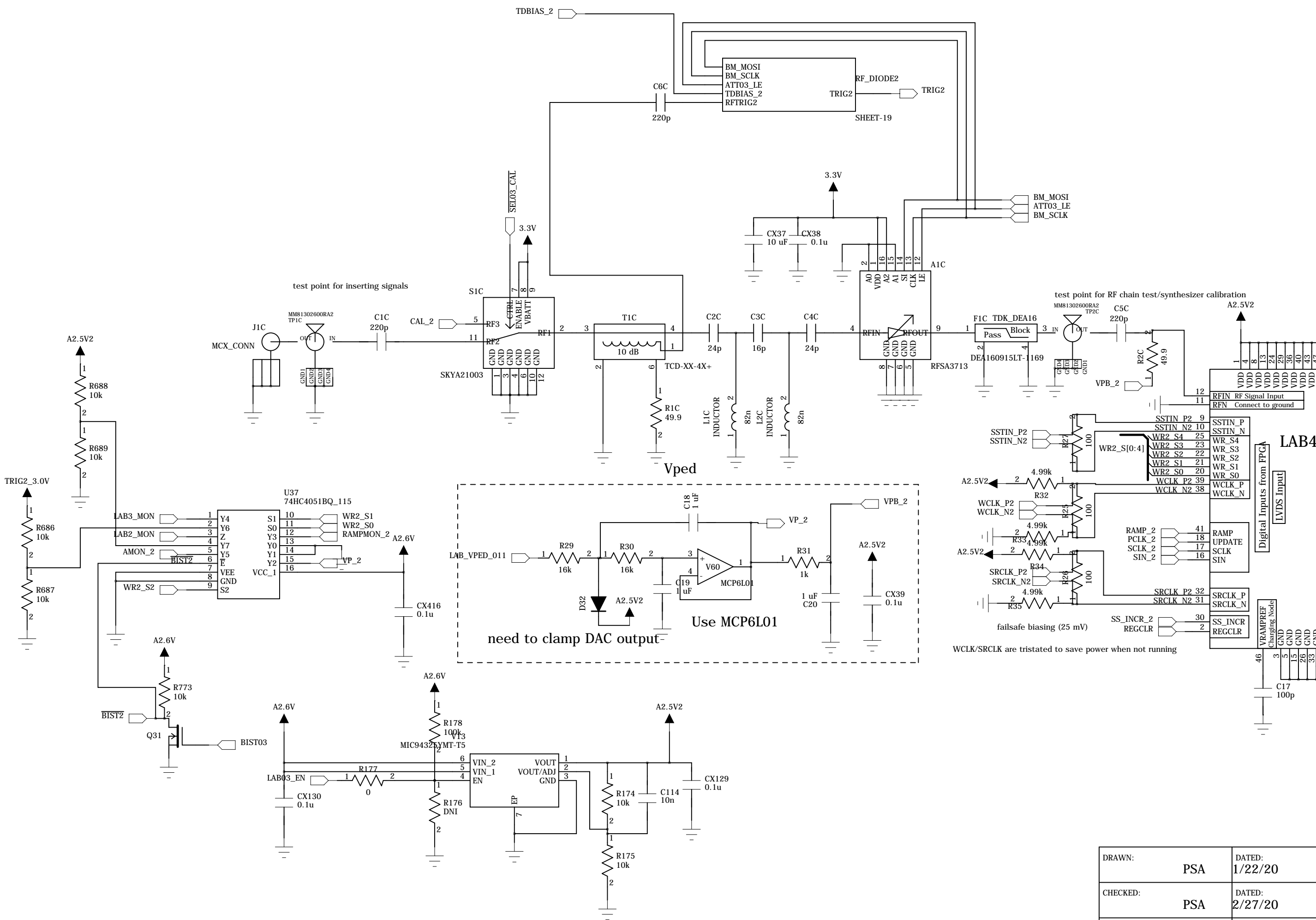
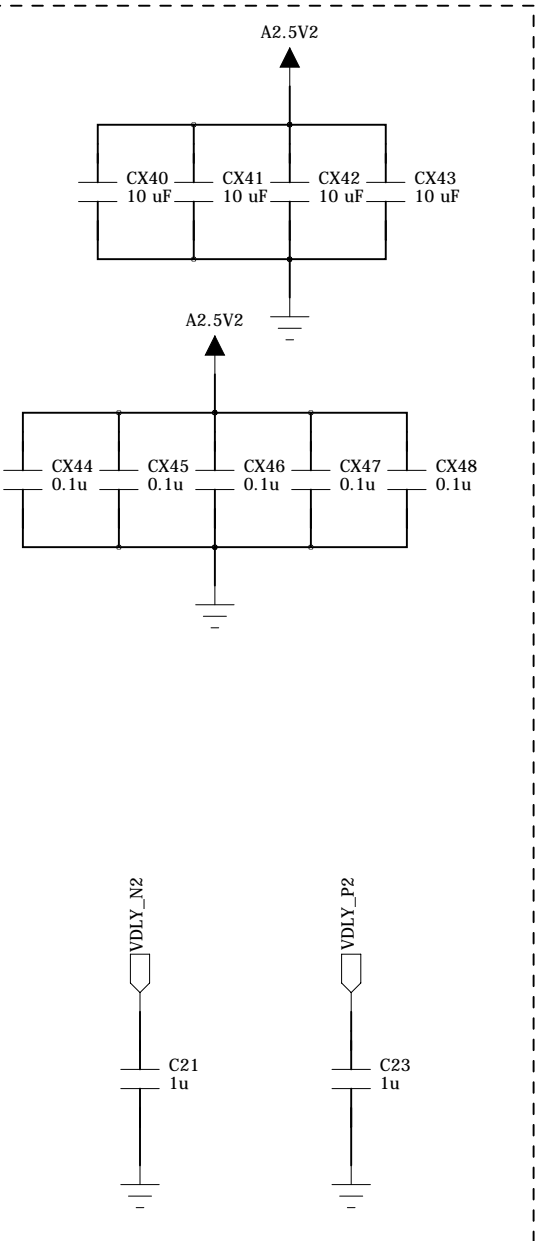
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNEL2 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 1 of 74 | |

6

5

4

3

2

1

D

C

B

A

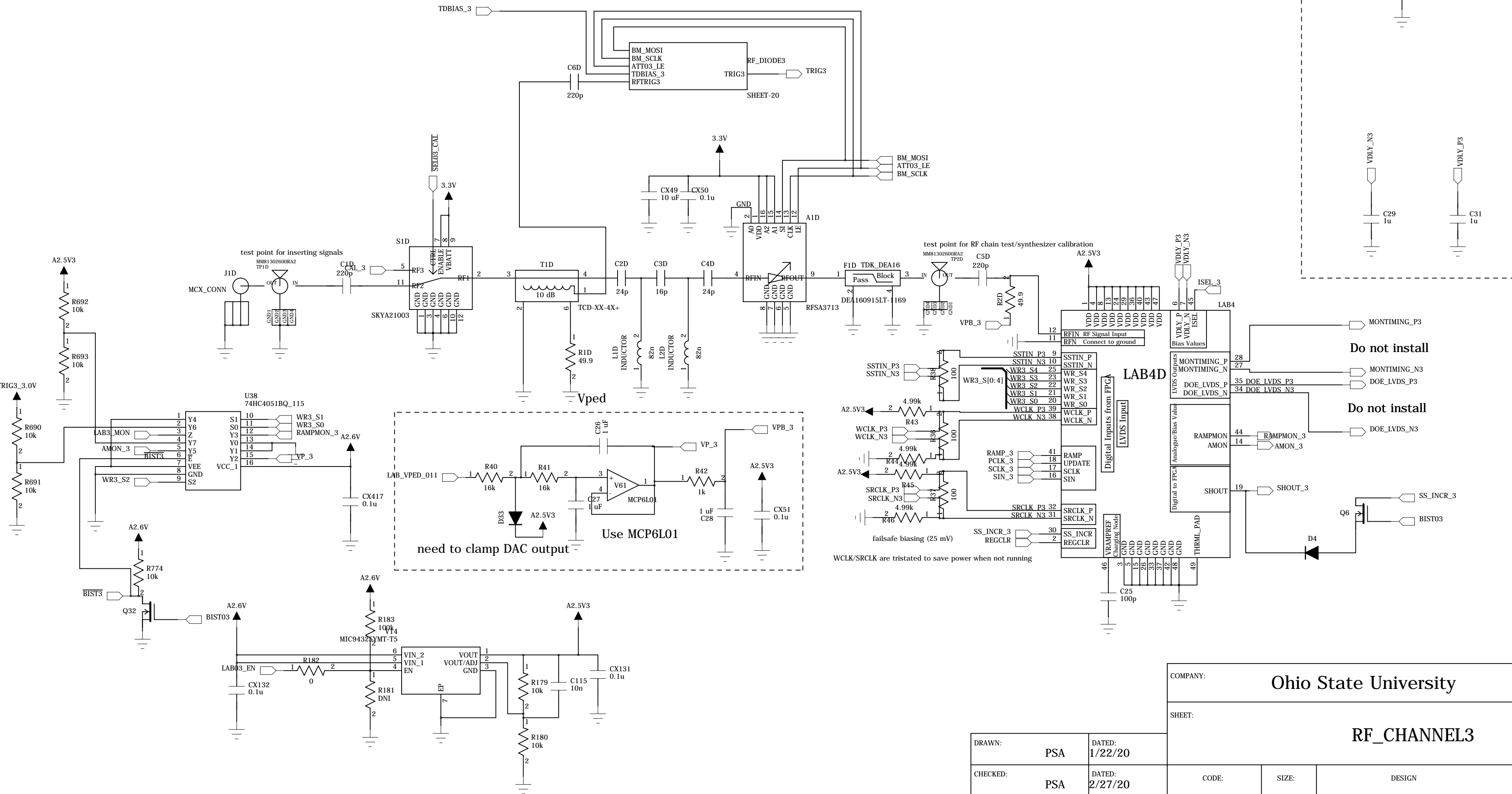
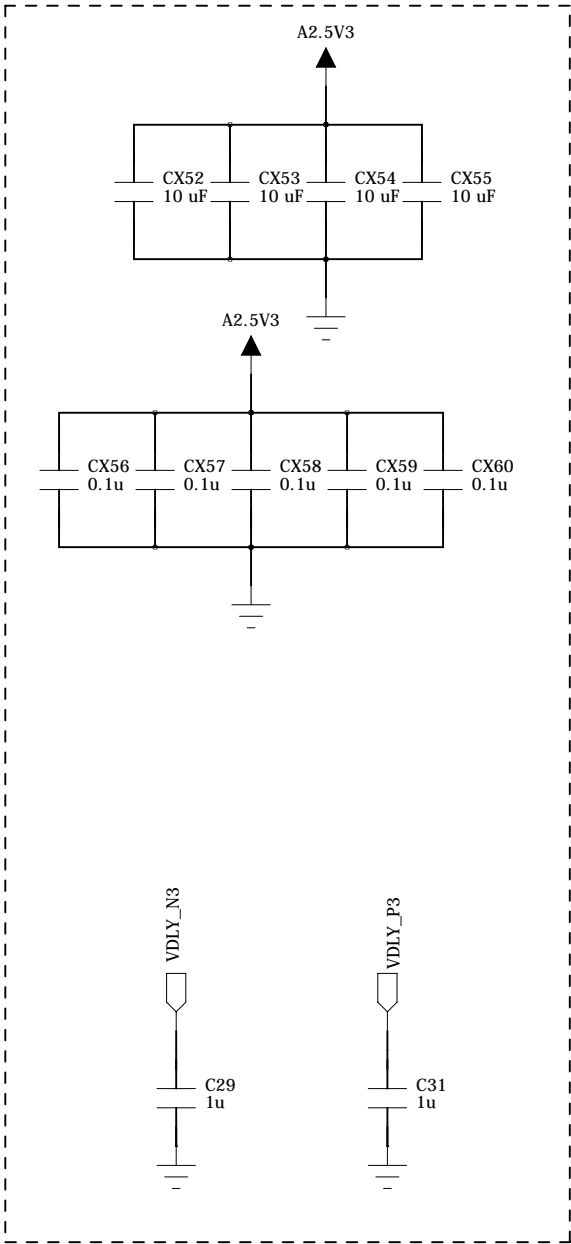
D

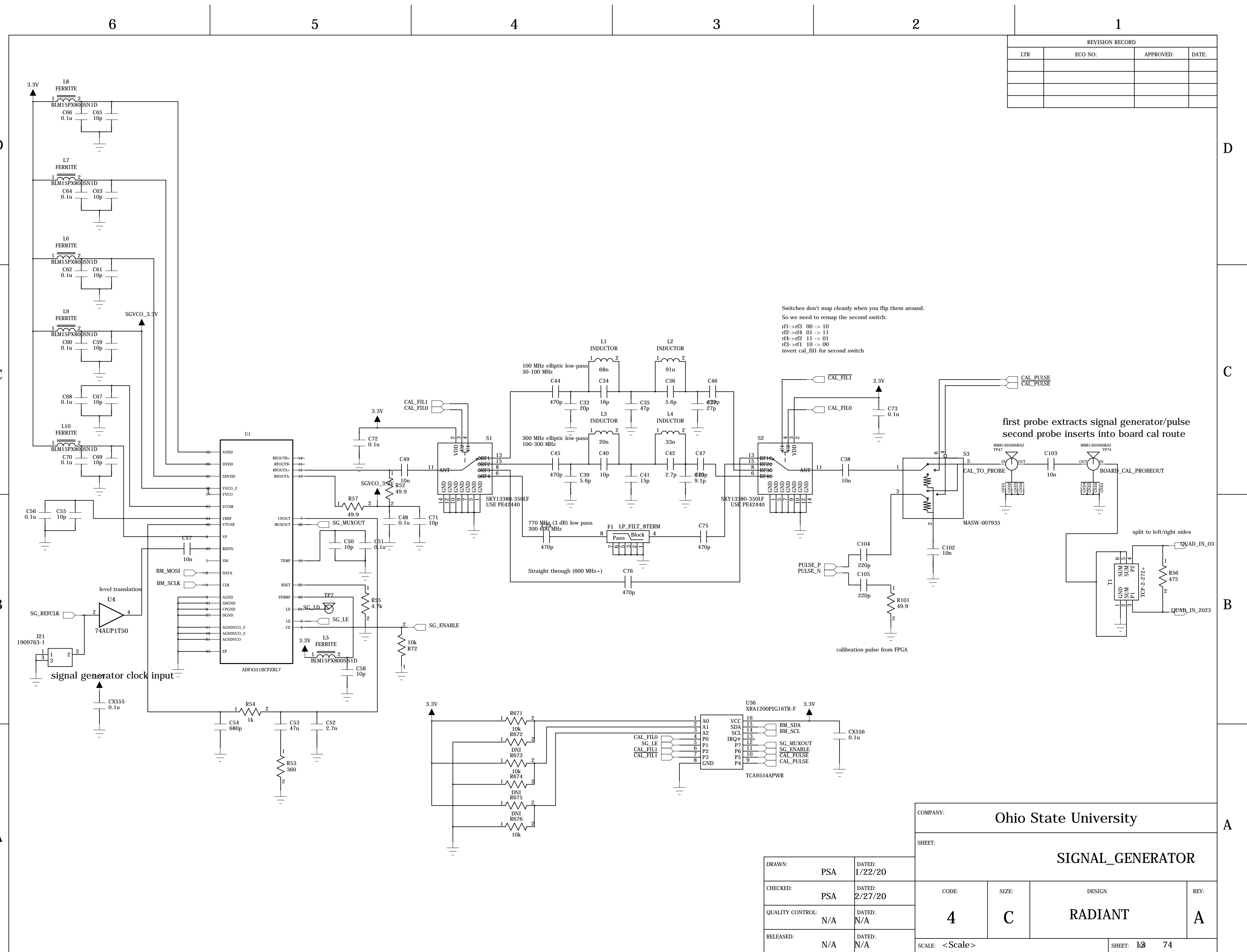
C

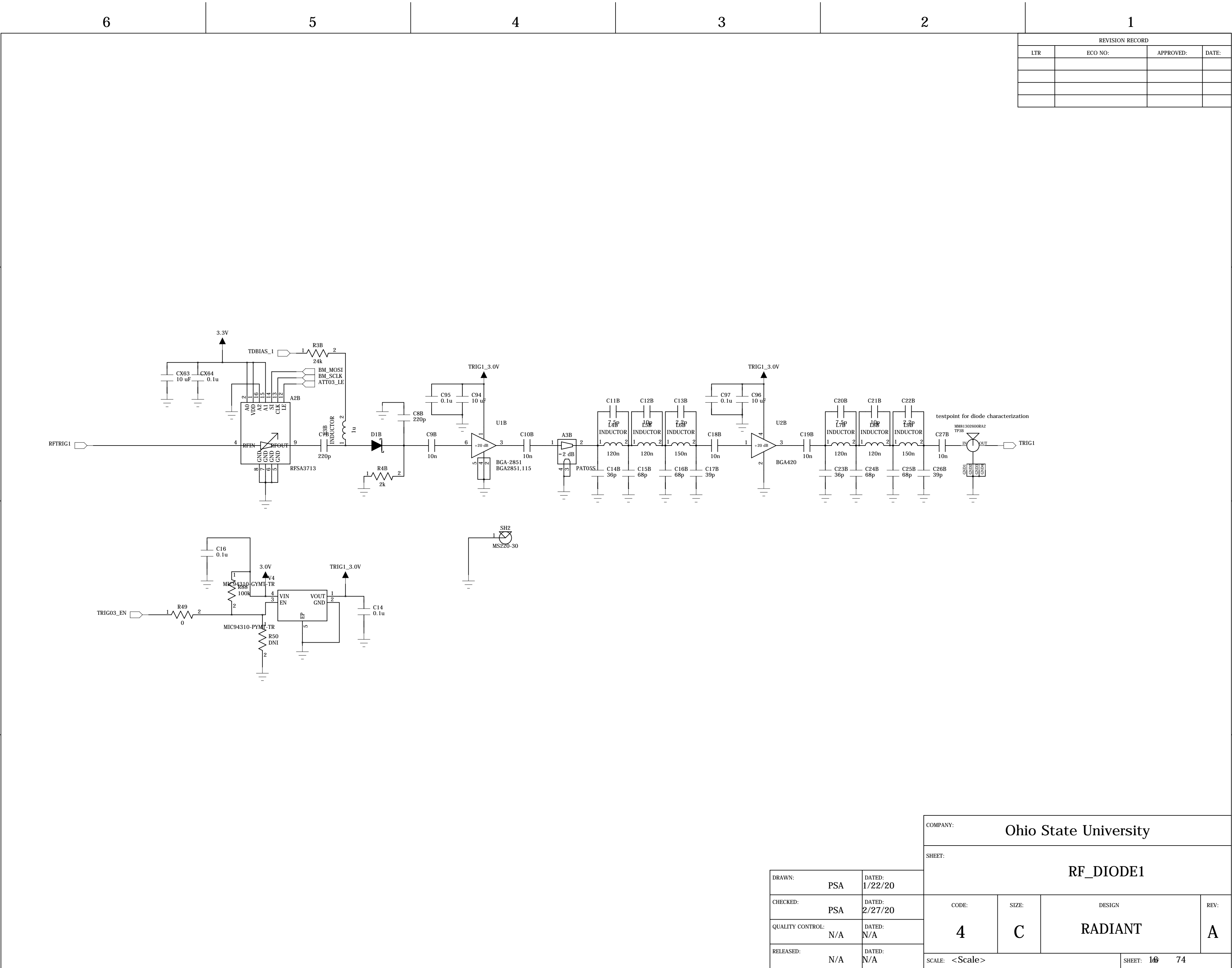
B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |







6

5

4

3

2

1

D

C

B

A

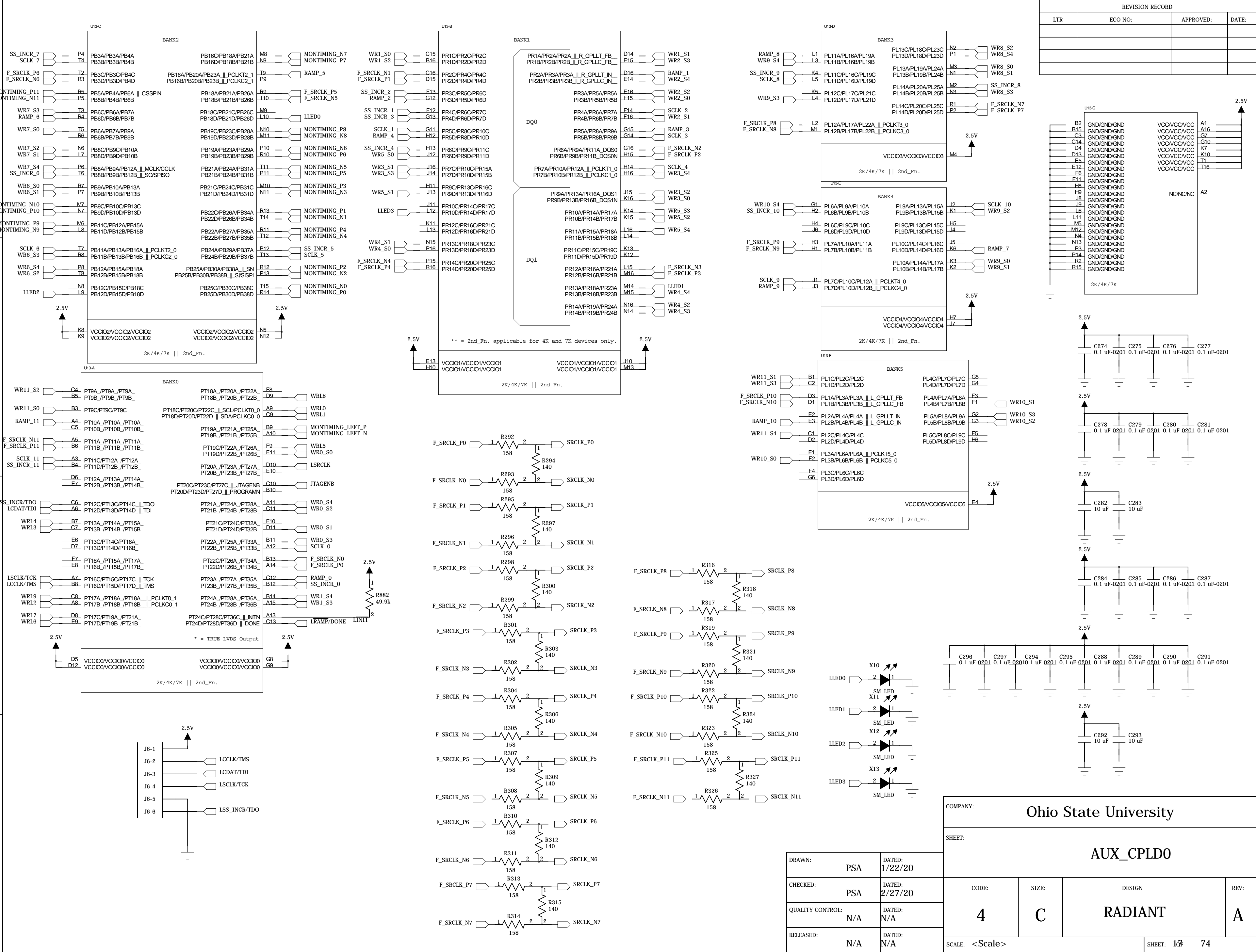
D

C

B

A

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|-----------------------|-------|-----------|------|
| COMPANY: | | | |
| Ohio State University | | | |
| SHEET: | | | |
| AUX_CPLD0 | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | SHEET: 17 | 74 |

6

5

4

3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |

RF_QUAD0 SHEET-7

| | | |
|----------|----------|-------------|
| SSTIN_P0 | SSTIN_P0 | DOE_LVDS_P0 |
| SSTIN_N0 | SSTIN_N0 | DOE_LVDS_N0 |
| SSTIN_P1 | SSTIN_P1 | DOE_LVDS_P1 |
| SSTIN_N1 | SSTIN_N1 | DOE_LVDS_N1 |
| SSTIN_P2 | SSTIN_P2 | DOE_LVDS_P2 |
| SSTIN_N2 | SSTIN_N2 | DOE_LVDS_N2 |
| SSTIN_P3 | SSTIN_P3 | DOE_LVDS_P3 |
| SSTIN_N3 | SSTIN_N3 | DOE_LVDS_N3 |
| SIN_0 | SIN_0 | |
| PCLK_0 | PCLK_0 | TRIG0 |
| SIN_1 | SIN_1 | TRIG1 |
| PCLK_1 | PCLK_1 | TRIG2 |
| SIN_2 | SIN_2 | TRIG3 |
| PCLK_2 | PCLK_2 | |
| SIN_3 | SIN_3 | |
| PCLK_3 | PCLK_3 | |

REGCLR Main FPGA/Clocking

| | |
|--------------|--------------|
| WCLK_P0 | WCLK_P0 |
| WCLK_N0 | WCLK_N0 |
| SRCLK_P0 | SRCLK_P0 |
| SRCLK_N0 | SRCLK_N0 |
| MONTIMING_P0 | MONTIMING_P0 |
| MONTIMING_N0 | MONTIMING_N0 |
| SCLK_0 | SCLK_0 |
| SS_INCR_0 | SS_INCR_0 |
| RAMP_0 | RAMP_0 |
| WCLK_P1 | WCLK_P1 |
| WCLK_N1 | WCLK_N1 |
| SRCLK_P1 | SRCLK_P1 |
| SRCLK_N1 | SRCLK_N1 |
| MONTIMING_P1 | MONTIMING_P1 |
| MONTIMING_N1 | MONTIMING_N1 |
| SCLK_1 | SCLK_1 |
| SS_INCR_1 | SS_INCR_1 |
| RAMP_1 | RAMP_1 |
| WCLK_P2 | WCLK_P2 |
| WCLK_N2 | WCLK_N2 |
| SRCLK_P2 | SRCLK_P2 |
| SRCLK_N2 | SRCLK_N2 |
| MONTIMING_P2 | MONTIMING_P2 |
| MONTIMING_N2 | MONTIMING_N2 |
| SCLK_2 | SCLK_2 |
| SS_INCR_2 | SS_INCR_2 |
| RAMP_2 | RAMP_2 |
| WCLK_P3 | WCLK_P3 |
| WCLK_N3 | WCLK_N3 |
| SRCLK_P3 | SRCLK_P3 |
| SRCLK_N3 | SRCLK_N3 |
| MONTIMING_P3 | MONTIMING_P3 |
| MONTIMING_N3 | MONTIMING_N3 |
| SCLK_3 | SCLK_3 |
| SS_INCR_3 | SS_INCR_3 |
| RAMP_3 | RAMP_3 |

Aux CPLD

QUAD_IN_03 QUAD_OUT_03

SEL_CAL_03_811 Calibration

| | |
|------------|--|
| ATT03_CS | |
| BM_SCLK | |
| BM_MOSI | |
| BM_SCL | |
| BM_SDA | |
| LAB_VPED_0 | |
| LAB_VPED_1 | |
| LAB_VPED_2 | |
| LAB_VPED_3 | |

Board Manager

RF_QUAD1 SHEET-21

| | | |
|----------|----------|-------------|
| SSTIN_P4 | SSTIN_P4 | DOE_LVDS_P0 |
| SSTIN_N4 | SSTIN_N4 | DOE_LVDS_N0 |
| SSTIN_P5 | SSTIN_P5 | DOE_LVDS_P1 |
| SSTIN_N5 | SSTIN_N5 | DOE_LVDS_N1 |
| SSTIN_P6 | SSTIN_P6 | DOE_LVDS_P2 |
| SSTIN_N6 | SSTIN_N6 | DOE_LVDS_N2 |
| SSTIN_P7 | SSTIN_P7 | DOE_LVDS_P3 |
| SSTIN_N7 | SSTIN_N7 | DOE_LVDS_N3 |
| SIN_4 | SIN_4 | |
| PCLK_4 | PCLK_4 | TRIG0 |
| SIN_5 | SIN_5 | TRIG1 |
| PCLK_5 | PCLK_5 | TRIG2 |
| SIN_6 | SIN_6 | TRIG3 |
| PCLK_6 | PCLK_6 | |
| SIN_7 | SIN_7 | |
| PCLK_7 | PCLK_7 | |

REGCLR Main FPGA/Clocking

| | |
|--------------|--------------|
| WCLK_P0 | WCLK_P0 |
| WCLK_N0 | WCLK_N0 |
| SRCLK_P0 | SRCLK_P0 |
| SRCLK_N0 | SRCLK_N0 |
| MONTIMING_P0 | MONTIMING_P0 |
| MONTIMING_N0 | MONTIMING_N0 |
| SCLK_0 | SCLK_0 |
| SS_INCR_0 | SS_INCR_0 |
| RAMP_0 | RAMP_0 |
| WCLK_P1 | WCLK_P1 |
| WCLK_N1 | WCLK_N1 |
| SRCLK_P1 | SRCLK_P1 |
| SRCLK_N1 | SRCLK_N1 |
| MONTIMING_P1 | MONTIMING_P1 |
| MONTIMING_N1 | MONTIMING_N1 |
| SCLK_1 | SCLK_1 |
| SS_INCR_1 | SS_INCR_1 |
| RAMP_1 | RAMP_1 |
| WCLK_P2 | WCLK_P2 |
| WCLK_N2 | WCLK_N2 |
| SRCLK_P2 | SRCLK_P2 |
| SRCLK_N2 | SRCLK_N2 |
| MONTIMING_P2 | MONTIMING_P2 |
| MONTIMING_N2 | MONTIMING_N2 |
| SCLK_2 | SCLK_2 |
| SS_INCR_2 | SS_INCR_2 |
| RAMP_2 | RAMP_2 |
| WCLK_P3 | WCLK_P3 |
| WCLK_N3 | WCLK_N3 |
| SRCLK_P3 | SRCLK_P3 |
| SRCLK_N3 | SRCLK_N3 |
| MONTIMING_P3 | MONTIMING_P3 |
| MONTIMING_N3 | MONTIMING_N3 |
| SCLK_3 | SCLK_3 |
| SS_INCR_3 | SS_INCR_3 |
| RAMP_3 | RAMP_3 |

Aux CPLD

QUAD_IN_03 QUAD_OUT_03

SEL_CAL_03_811 Calibration

| | |
|------------|--|
| ATT03_CS | |
| BM_SCLK | |
| BM_MOSI | |
| BM_SCL | |
| BM_SDA | |
| LAB_VPED_0 | |
| LAB_VPED_1 | |
| LAB_VPED_2 | |
| LAB_VPED_3 | |

Board Manager

RF_QUAD2 SHEET-31

| | | |
|----------|----------|-------------|
| SSTIN_P4 | SSTIN_P4 | DOE_LVDS_P0 |
| SSTIN_N4 | SSTIN_N4 | DOE_LVDS_N0 |
| SSTIN_P5 | SSTIN_P5 | DOE_LVDS_P1 |
| SSTIN_N5 | SSTIN_N5 | DOE_LVDS_N1 |
| SSTIN_P6 | SSTIN_P6 | DOE_LVDS_P2 |
| SSTIN_N6 | SSTIN_N6 | DOE_LVDS_N2 |
| SSTIN_P7 | SSTIN_P7 | DOE_LVDS_P3 |
| SSTIN_N7 | SSTIN_N7 | DOE_LVDS_N3 |
| SIN_4 | SIN_4 | |
| PCLK_4 | PCLK_4 | TRIG0 |
| SIN_5 | SIN_5 | TRIG1 |
| PCLK_5 | PCLK_5 | TRIG2 |
| SIN_6 | SIN_6 | TRIG3 |
| PCLK_6 | PCLK_6 | |
| SIN_7 | SIN_7 | |
| PCLK_7 | PCLK_7 | |

REGCLR Main FPGA/Clocking

| | |
|--------------|--------------|
| WCLK_P0 | WCLK_P0 |
| WCLK_N0 | WCLK_N0 |
| SRCLK_P0 | SRCLK_P0 |
| SRCLK_N0 | SRCLK_N0 |
| MONTIMING_P0 | MONTIMING_P0 |
| MONTIMING_N0 | MONTIMING_N0 |
| SCLK_0 | SCLK_0 |
| SS_INCR_0 | SS_INCR_0 |
| RAMP_0 | RAMP_0 |
| WCLK_P1 | WCLK_P1 |
| WCLK_N1 | WCLK_N1 |
| SRCLK_P1 | SRCLK_P1 |
| SRCLK_N1 | SRCLK_N1 |
| MONTIMING_P1 | MONTIMING_P1 |
| MONTIMING_N1 | MONTIMING_N1 |
| SCLK_1 | SCLK_1 |
| SS_INCR_1 | SS_INCR_1 |
| RAMP_1 | RAMP_1 |
| WCLK_P2 | WCLK_P2 |
| WCLK_N2 | WCLK_N2 |
| SRCLK_P2 | SRCLK_P2 |
| SRCLK_N2 | SRCLK_N2 |
| MONTIMING_P2 | MONTIMING_P2 |
| MONTIMING_N2 | MONTIMING_N2 |
| SCLK_2 | SCLK_2 |
| SS_INCR_2 | SS_INCR_2 |
| RAMP_2 | RAMP_2 |
| WCLK_P3 | WCLK_P3 |
| WCLK_N3 | WCLK_N3 |
| SRCLK_P3 | SRCLK_P3 |
| SRCLK_N3 | SRCLK_N3 |
| MONTIMING_P3 | MONTIMING_P3 |
| MONTIMING_N3 | MONTIMING_N3 |
| SCLK_3 | SCLK_3 |
| SS_INCR_3 | SS_INCR_3 |
| RAMP_3 | RAMP_3 |

Aux CPLD

QUAD_IN_03 QUAD_OUT_03

SEL_CAL_03_811 Calibration

| | |
|------------|--|
| ATT03_CS | |
| BM_SCLK | |
| BM_MOSI | |
| BM_SCL | |
| BM_SDA | |
| LAB_VPED_0 | |
| LAB_VPED_1 | |
| LAB_VPED_2 | |
| LAB_VPED_3 | |

Board Manager

COMPANY:

Ohio State University

SHEET:

RF_LEFT

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

CODE:

4

SIZE:

C

DESIGN

RADIANT

REV:

A

SCALE: <Scale>

SHEET: 18 74

6

5

4

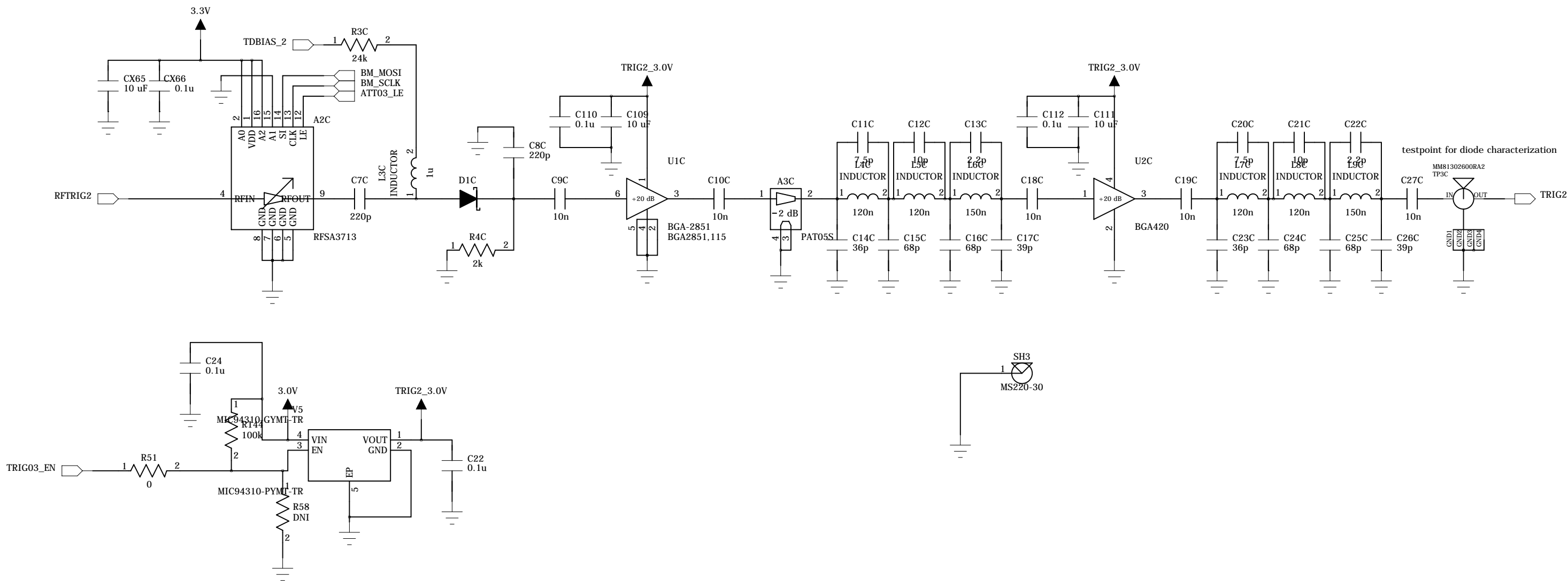
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



COMPANY:

Ohio State University

SHEET:

RF_DIODE2

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|----------------|-------|---------|--------------|
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 19 74 |

6

5

4

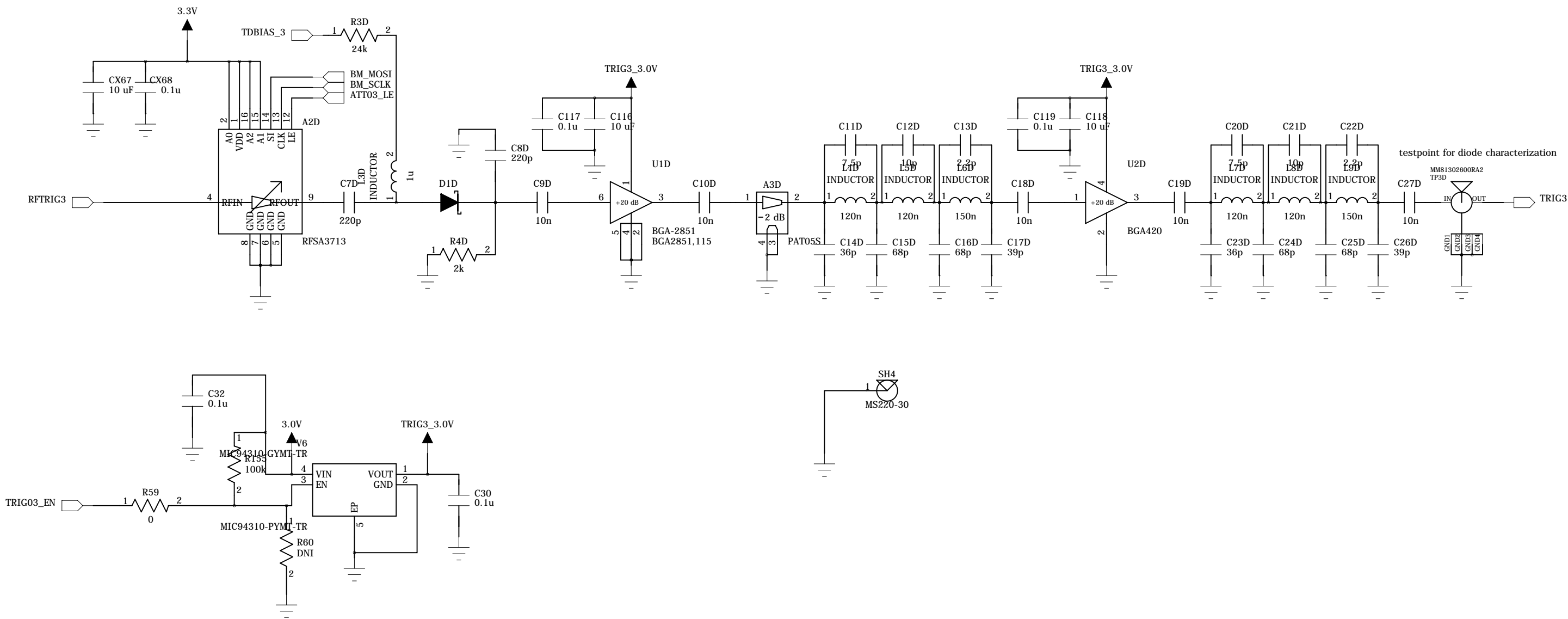
3

2

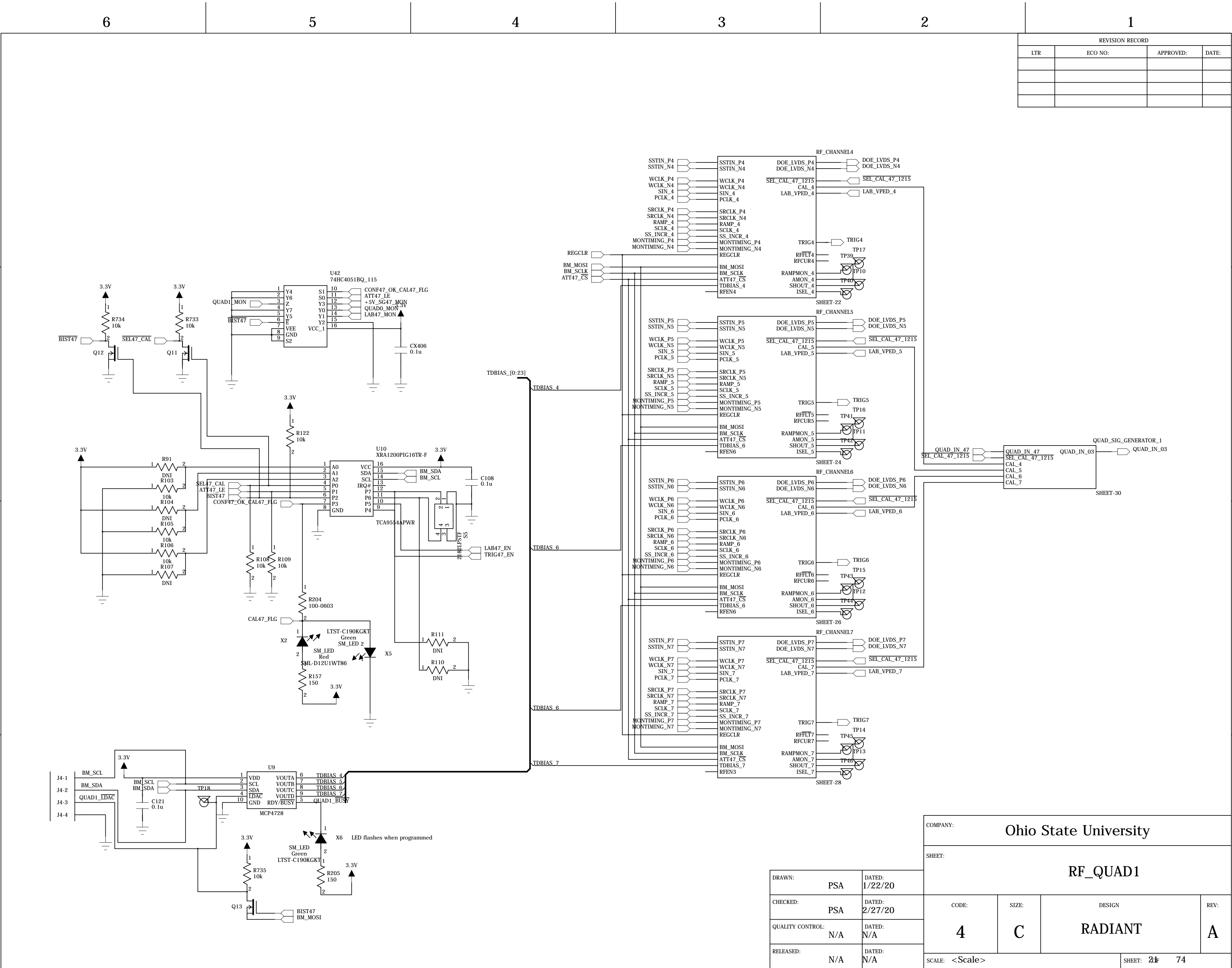
1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



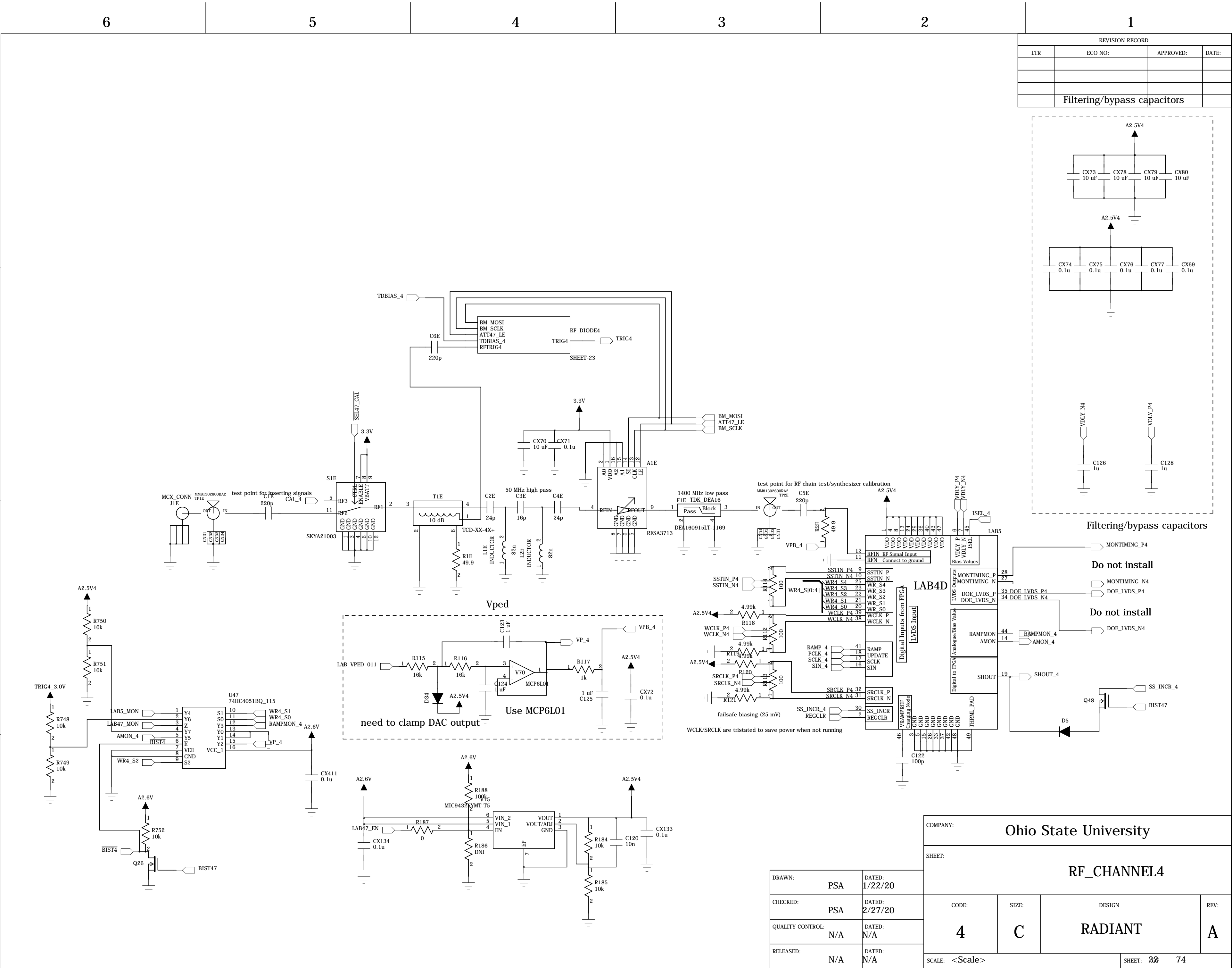
| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE3 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 20 74 |



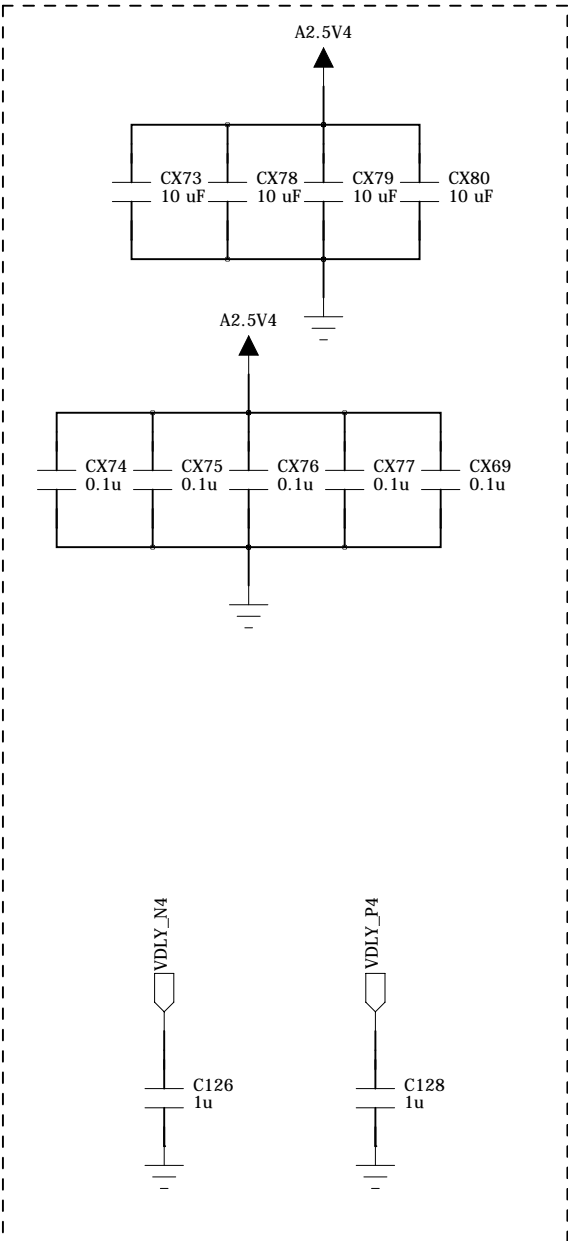
| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_QUAD1 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 21 74 |

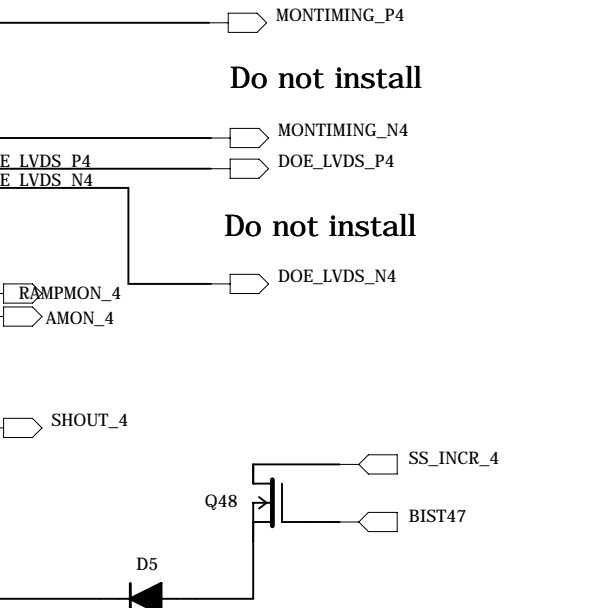
| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |



| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



Filtering/bypass capacitors



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNEL4 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 22 74 | |

6

5

4

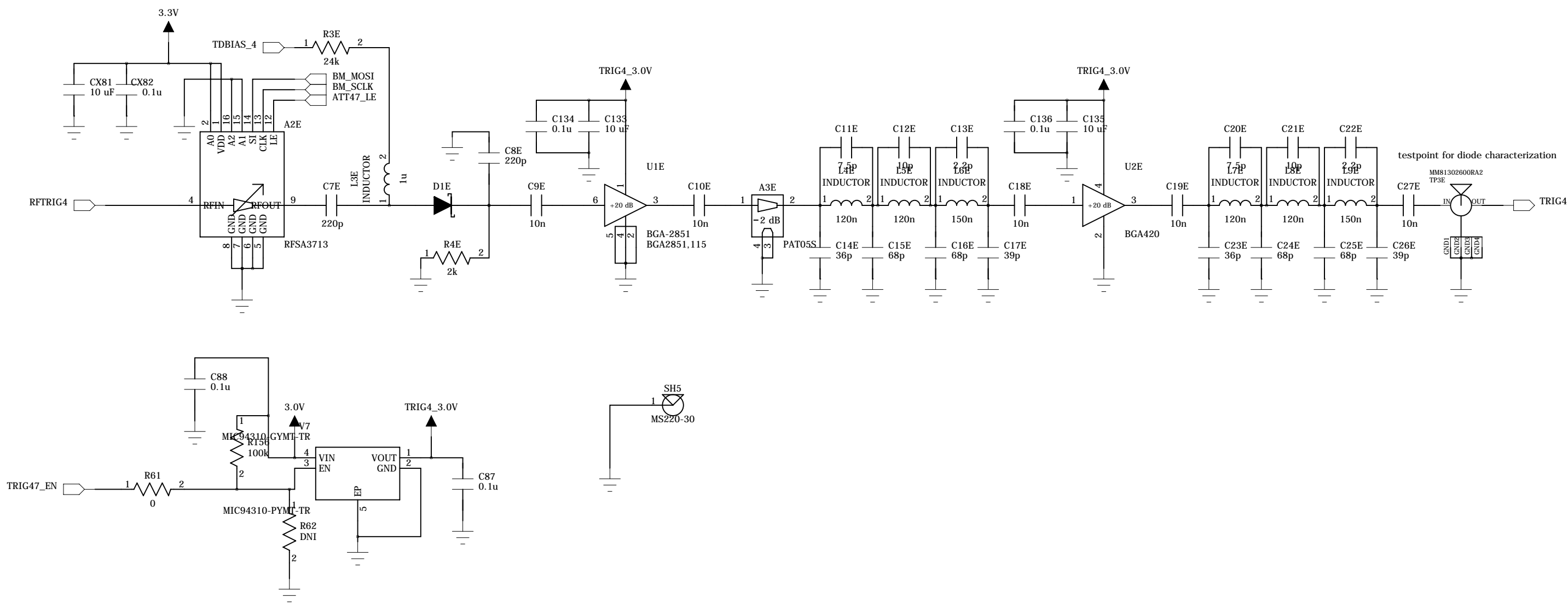
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE4 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 23 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

3

2

1

D

C

B

A

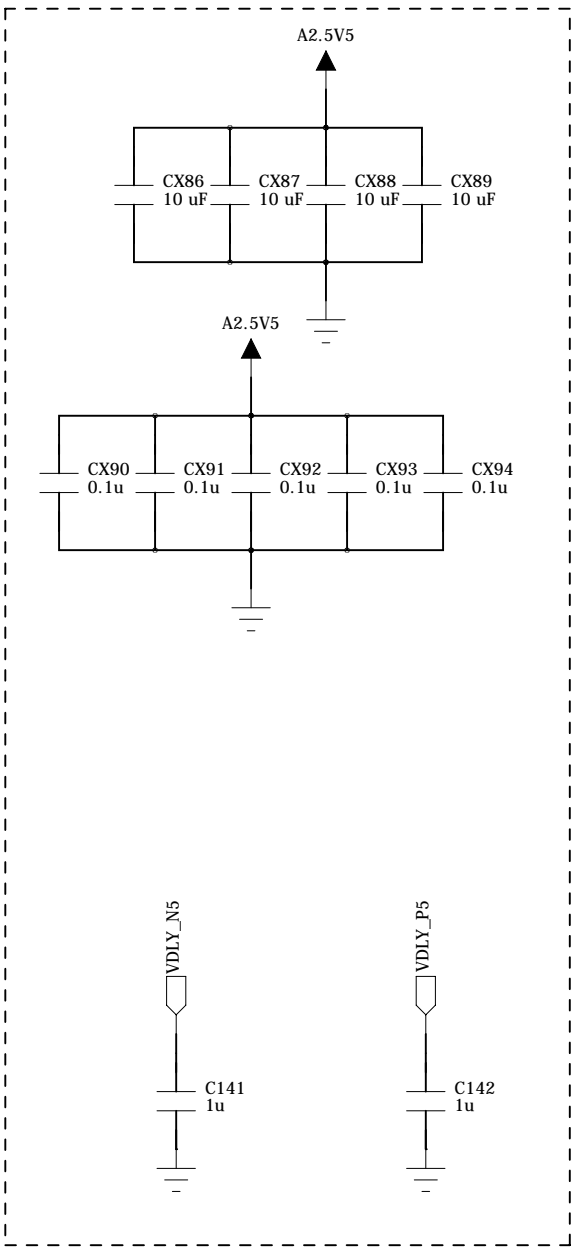
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |

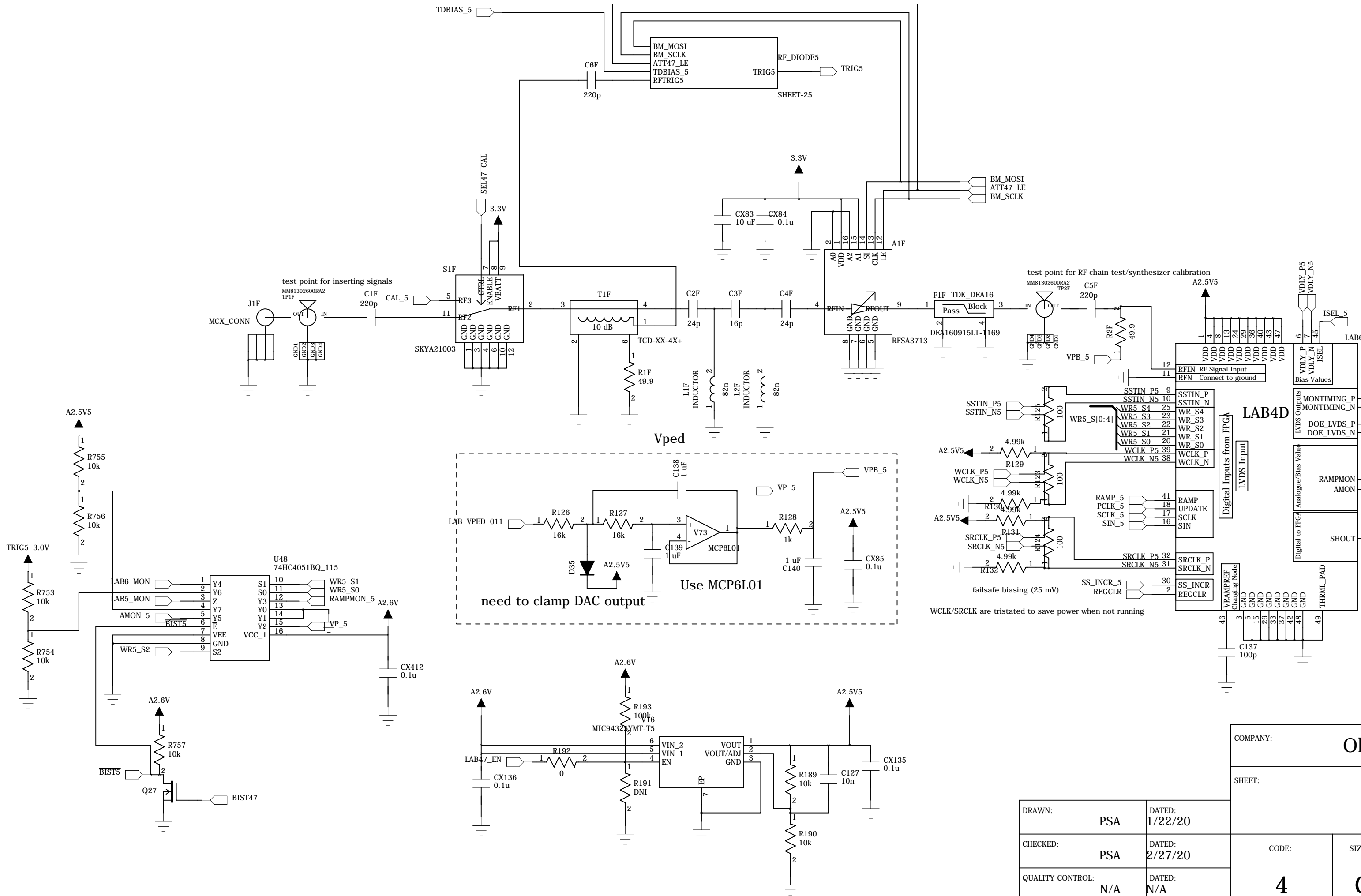


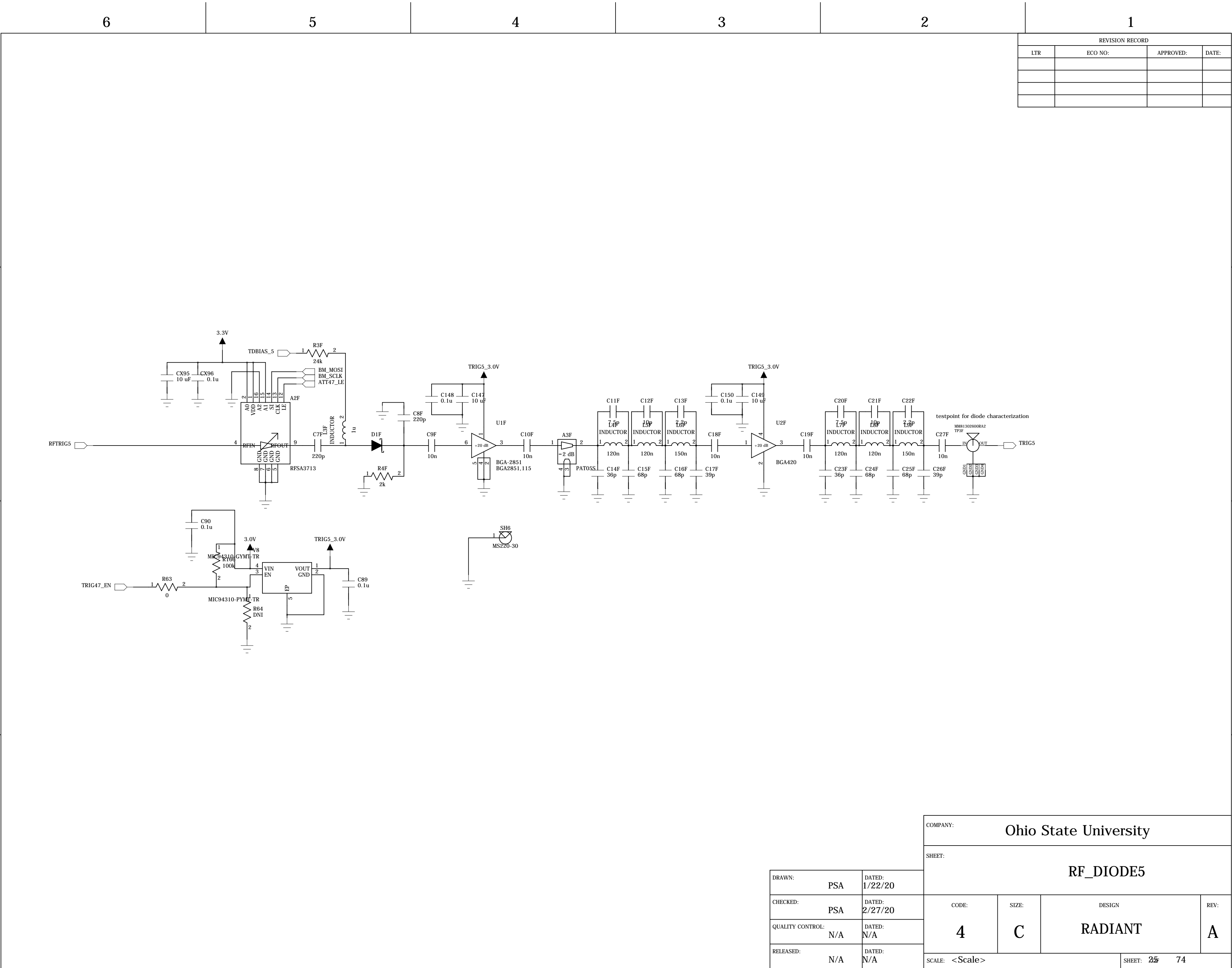
Filtering/bypass capacitors

Do not install

Do not install

| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNEL5 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 24 74 | |





| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE5 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 25 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

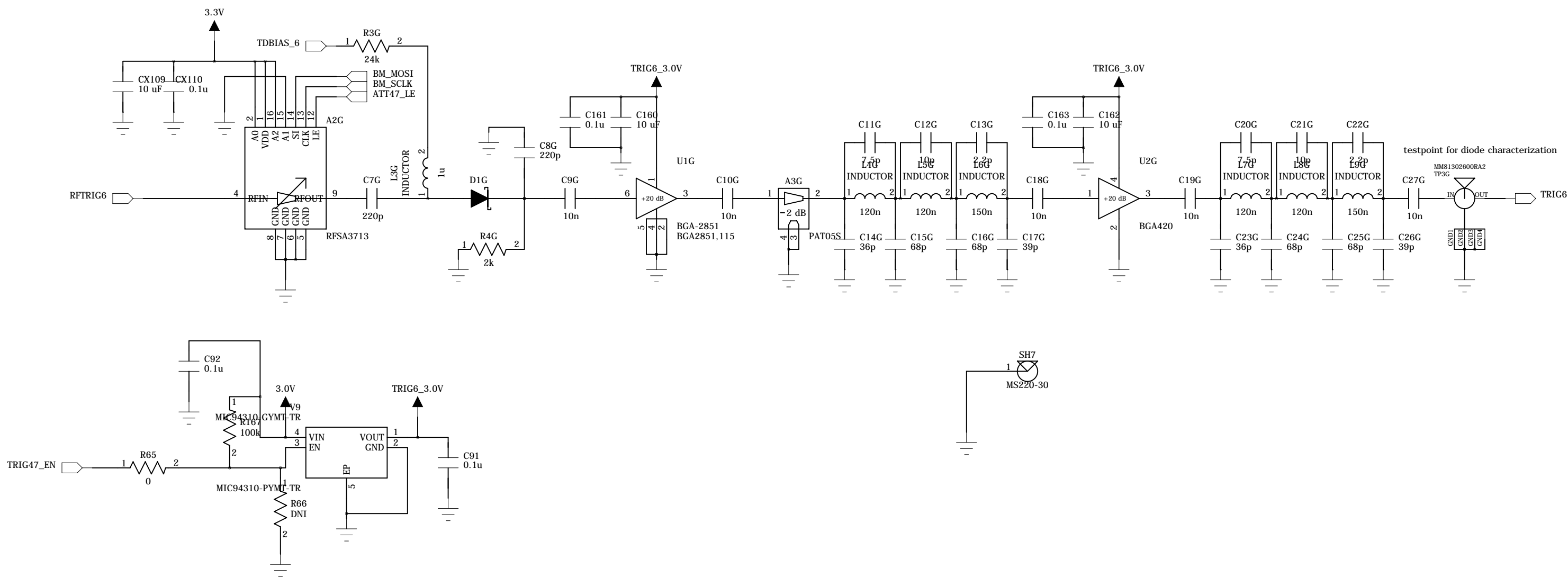
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE6 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 27 74 |

6

5

4

3

2

1

D

C

B

A

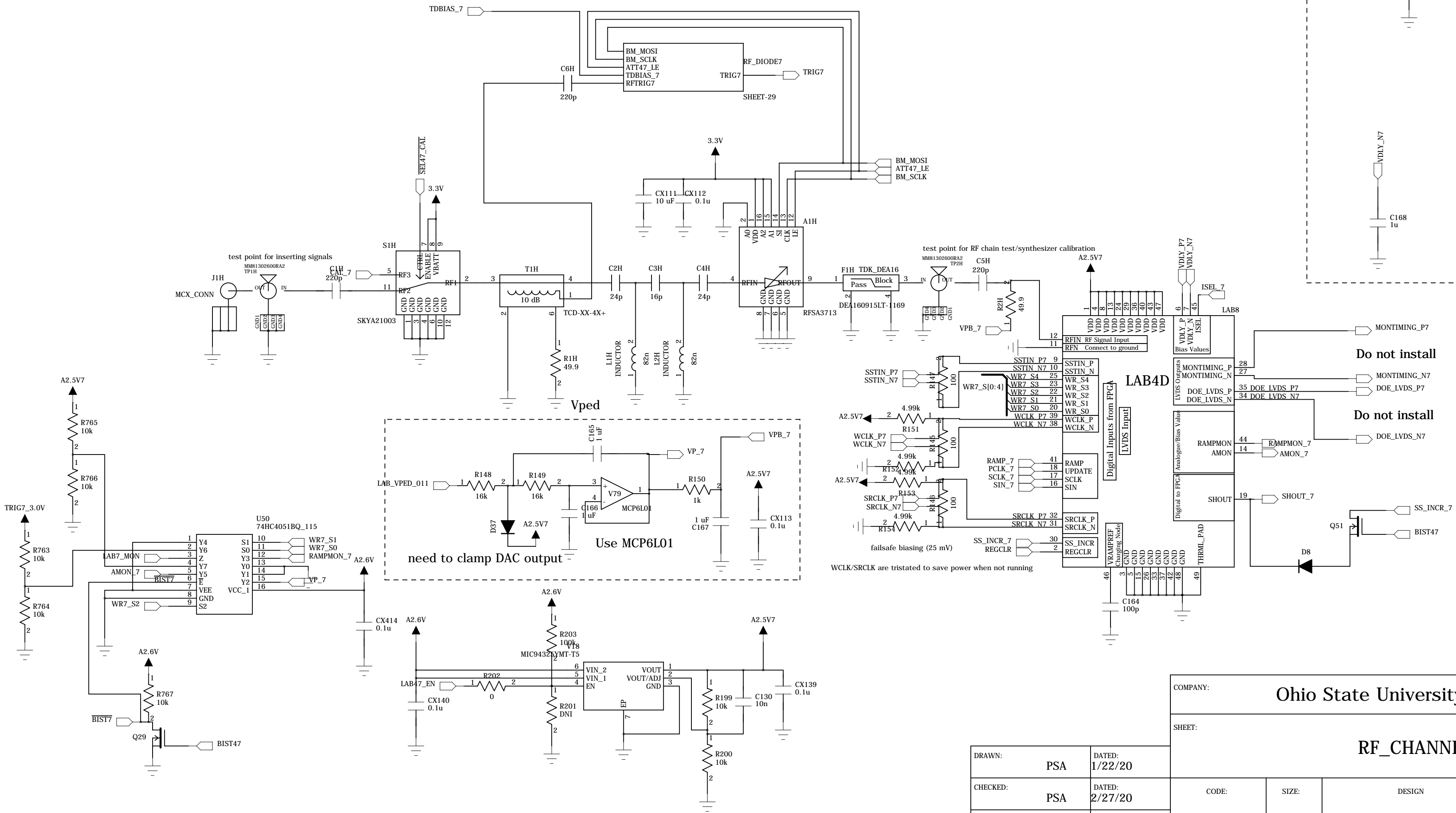
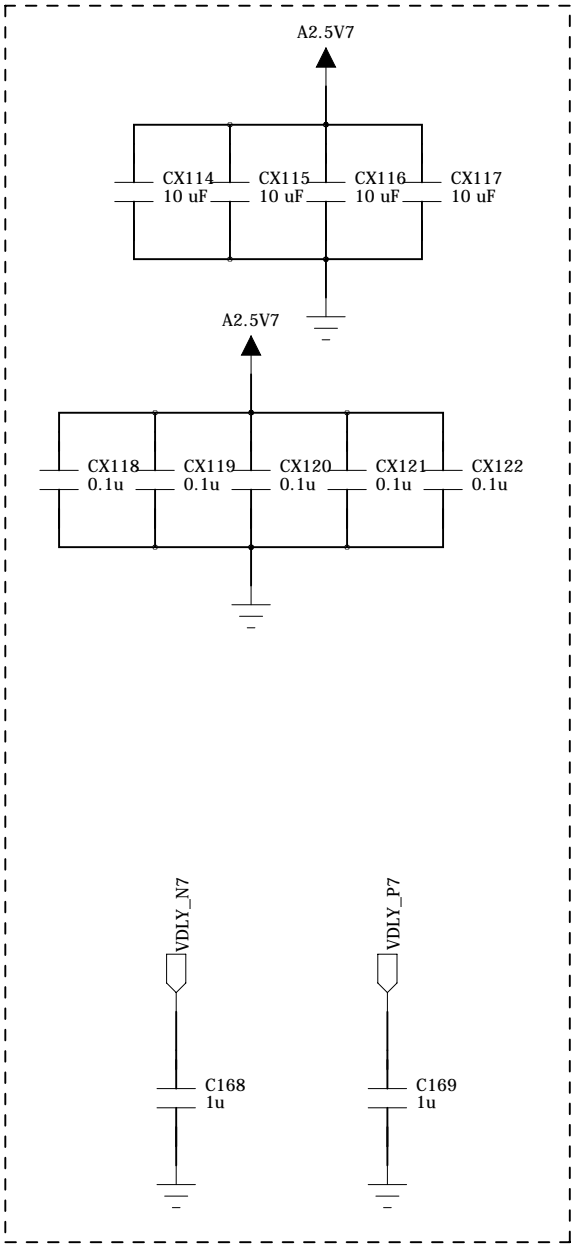
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNEL7 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 28 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

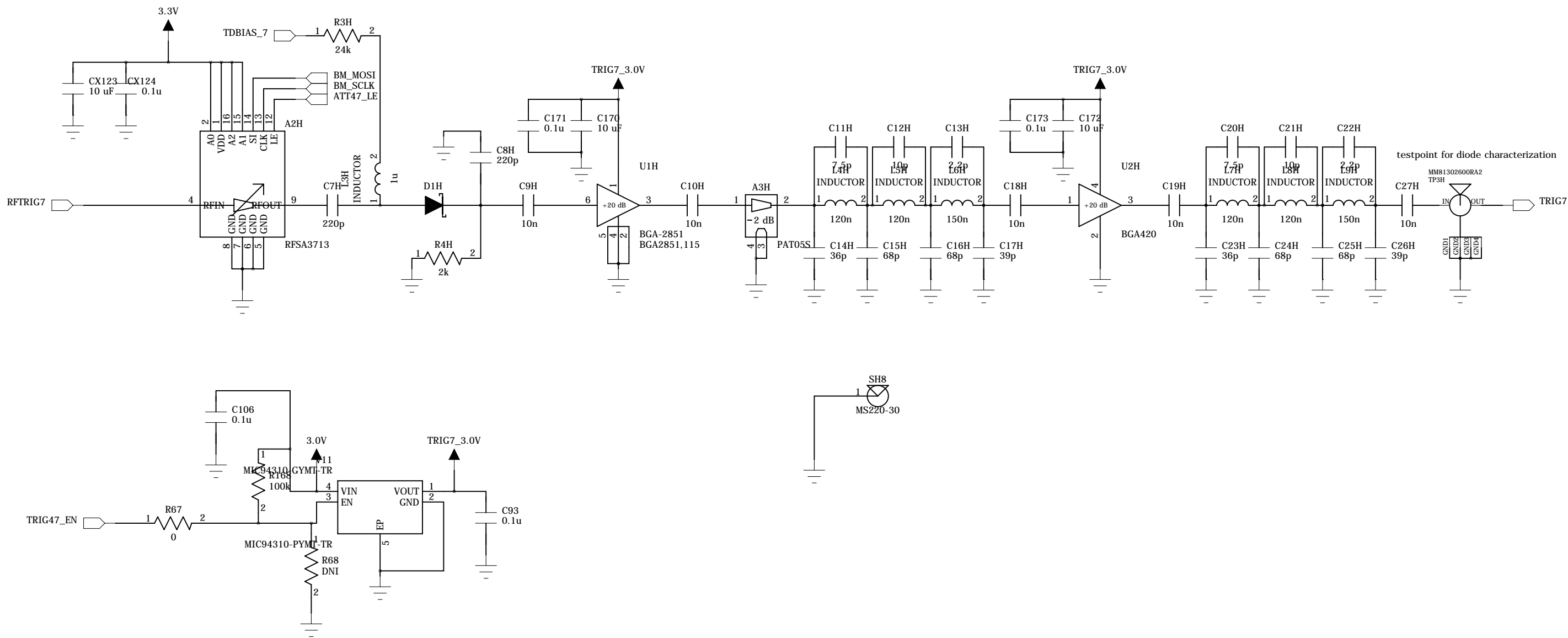
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



COMPANY:

Ohio State University

SHEET:

RF_DIODE7

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

CODE:

4

SIZE:

C

DESIGN

RADIANT

REV:

A

SCALE: <Scale>

SHEET: 29 74

6

5

4

3

2

1

D

C

B

A

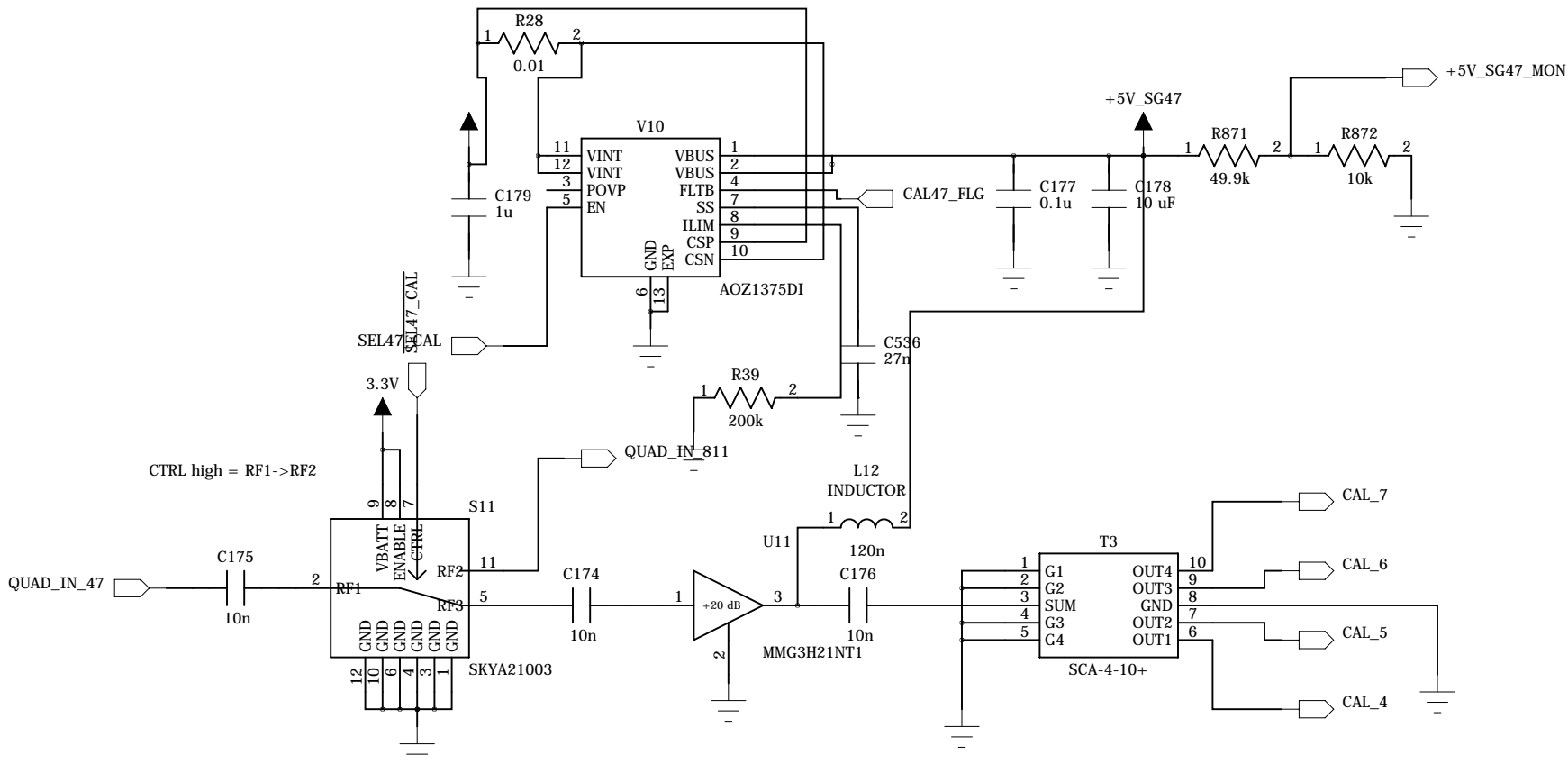
D

C

B

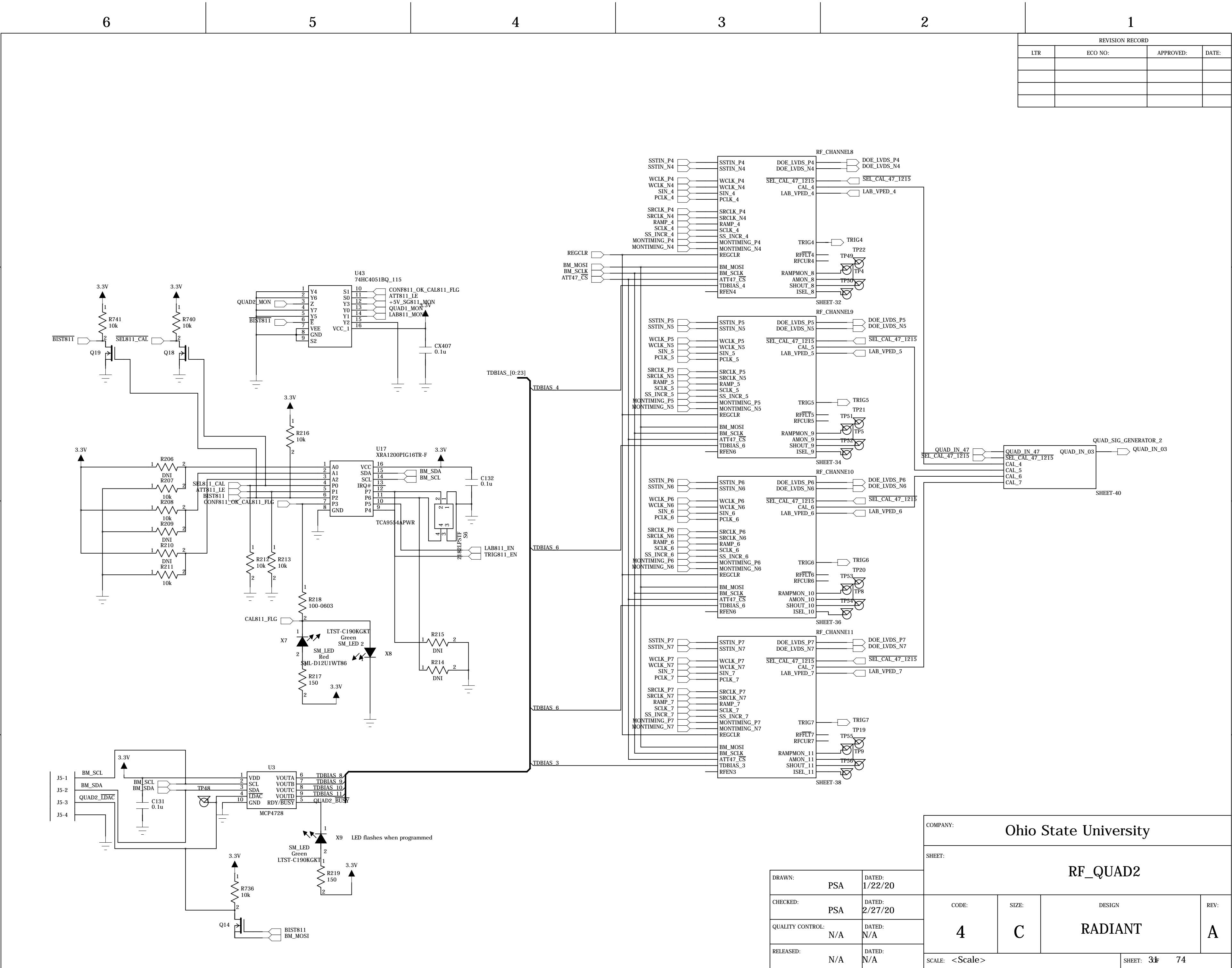
A

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|--------------------------------|-------|---------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: QUAD_SIG_GENERATOR_1 | | | |
| CODE: | SIZE: | DESIGN: | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 30 74 |



| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_Quad2 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 34 of 74 | |

6

5

4

3

2

1

D

C

B

A

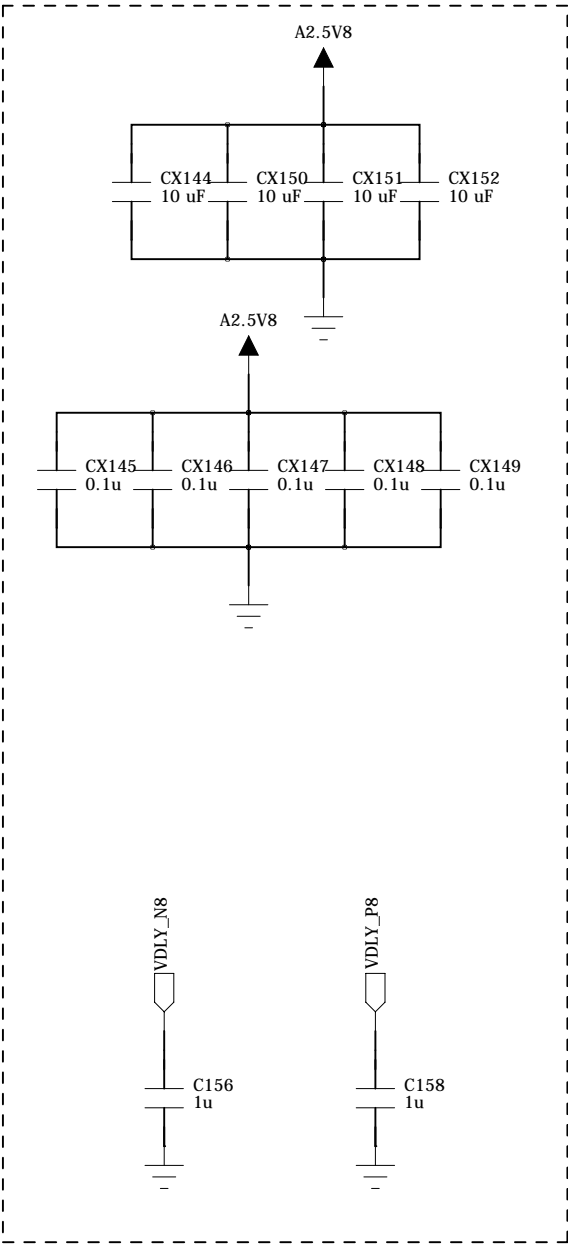
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |

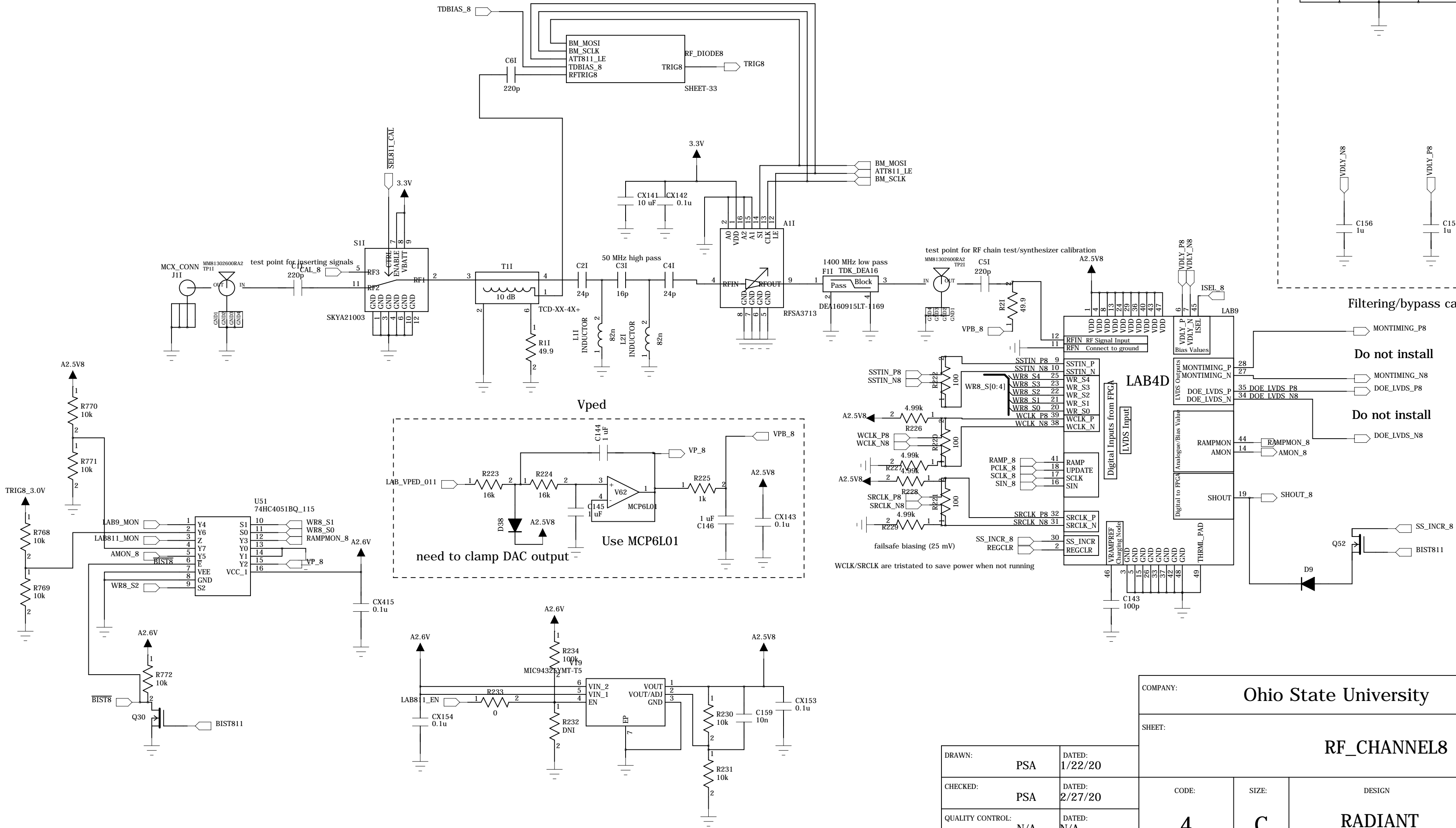


Filtering/bypass capacitors

Do not install

Do not install

| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNEL8 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 32 74 | |



6

5

4

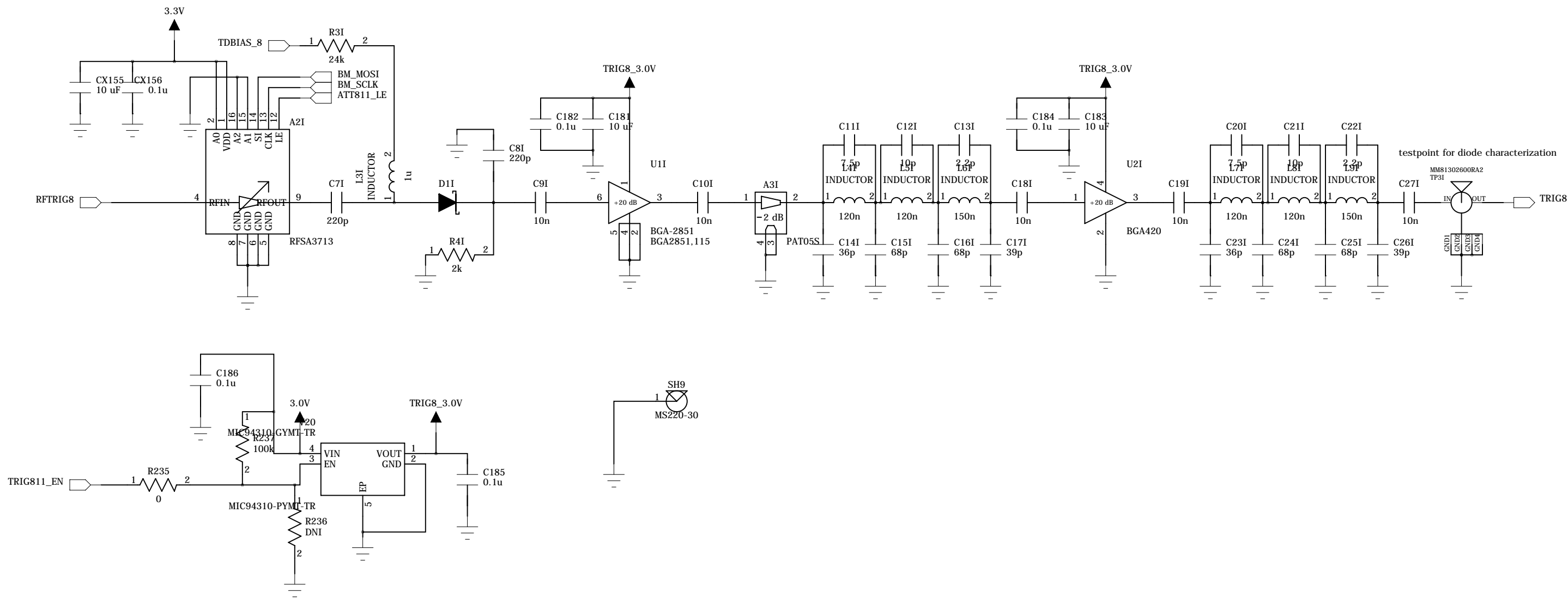
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE8 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 38 74 |

6

5

4

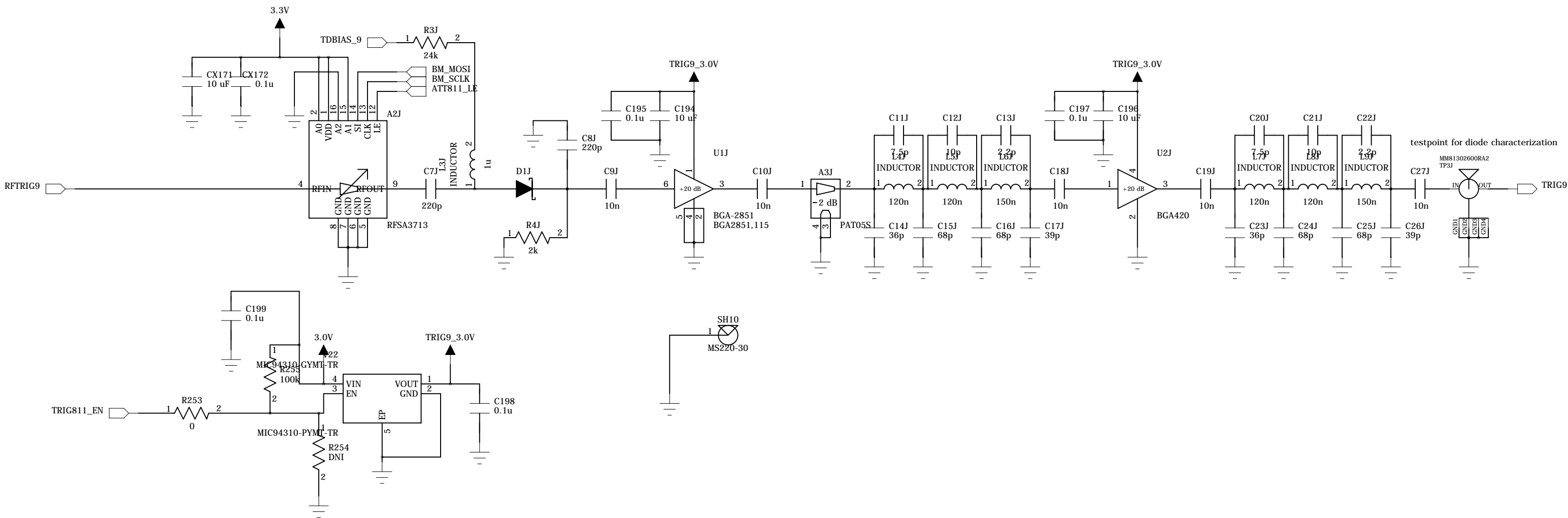
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIODE9 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 35 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

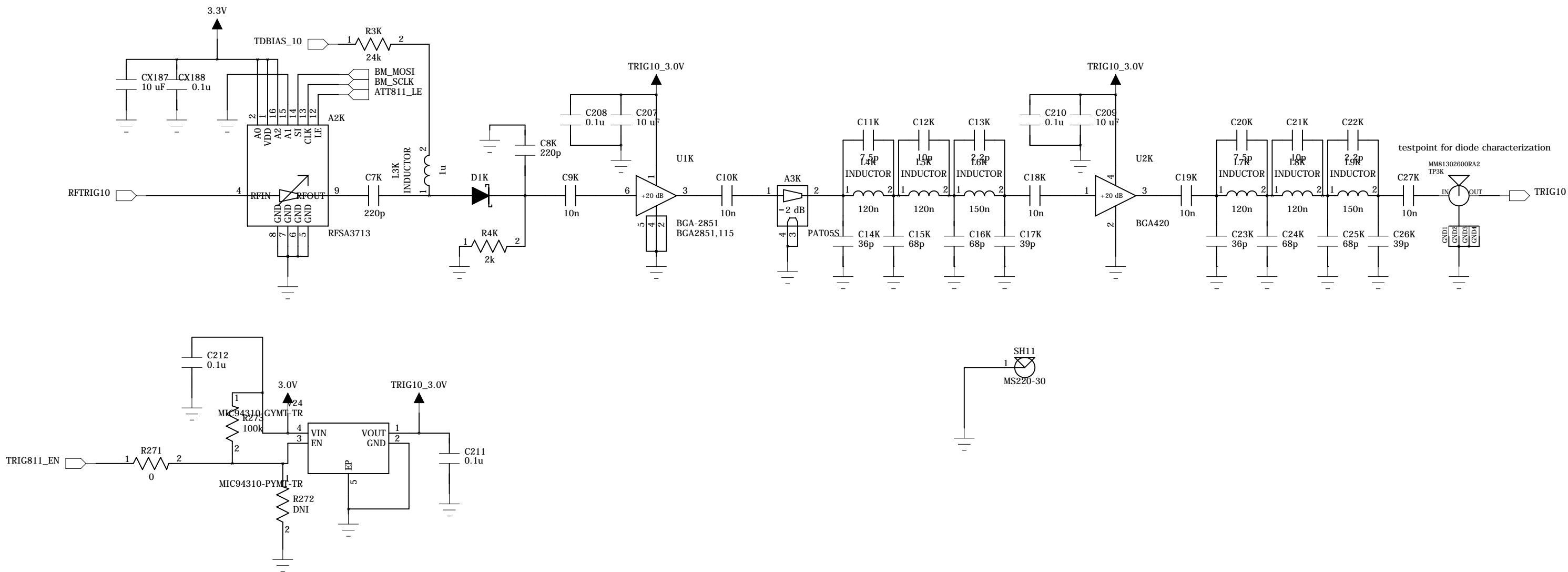
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



COMPANY:

Ohio State University

SHEET:

RF_DIOD10

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|----------------|-------|---------|--------------|
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 37 74 |

6

5

4

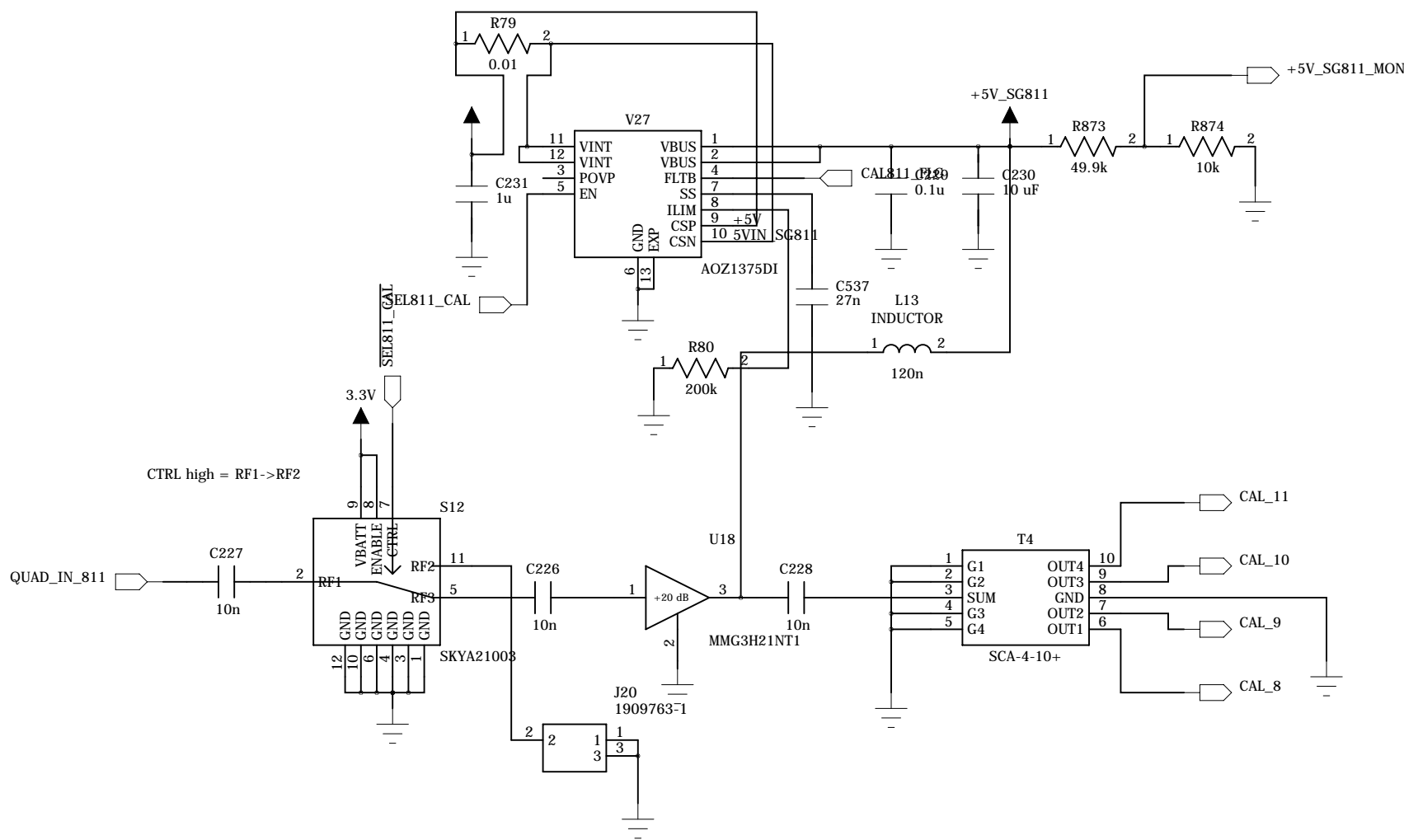
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



COMPANY: Ohio State University

SHEET: QUAD_SIG_GENERATOR_2

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|-------|-------|---------|------|
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |

SCALE: <Scale> SHEET: 40 74

6

5

4

3

2

1

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

D

D

C

2

there's stuff here, it's just off-sheet cuz it's too big

B

3

A

A

| | | | | | |
|--|--|-------------------------------|--------|----------------|-------|
| <div>DRAWN:PSA</div> <div>CHECKED:PSA</div> <div>QUALITY CONTROL:N/A</div> <div>RELEASED:N/A</div> | | COMPANY:Ohio State University | | | |
| | | SHEET:AUXCPLDS | | | |
| | | CODE:4 | SIZE:C | DESIGN:RADIANT | REV:A |
| | | SCALE: <Scale> | | SHEET: 41 | 74 |

6

5

4

3

2

1

D

C

B

A

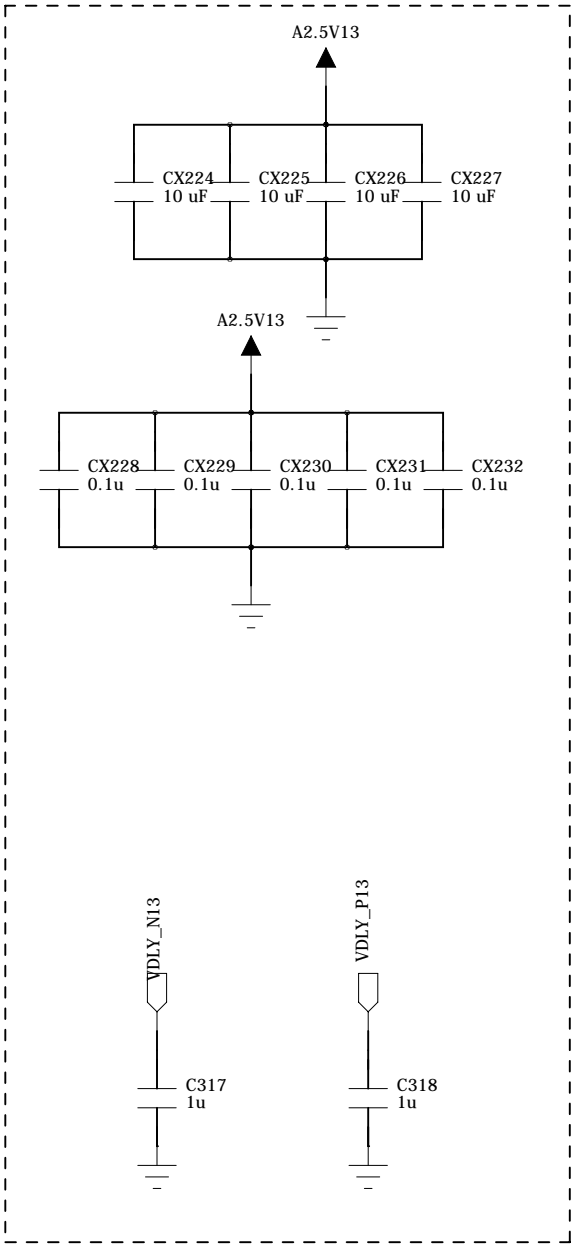
D

C

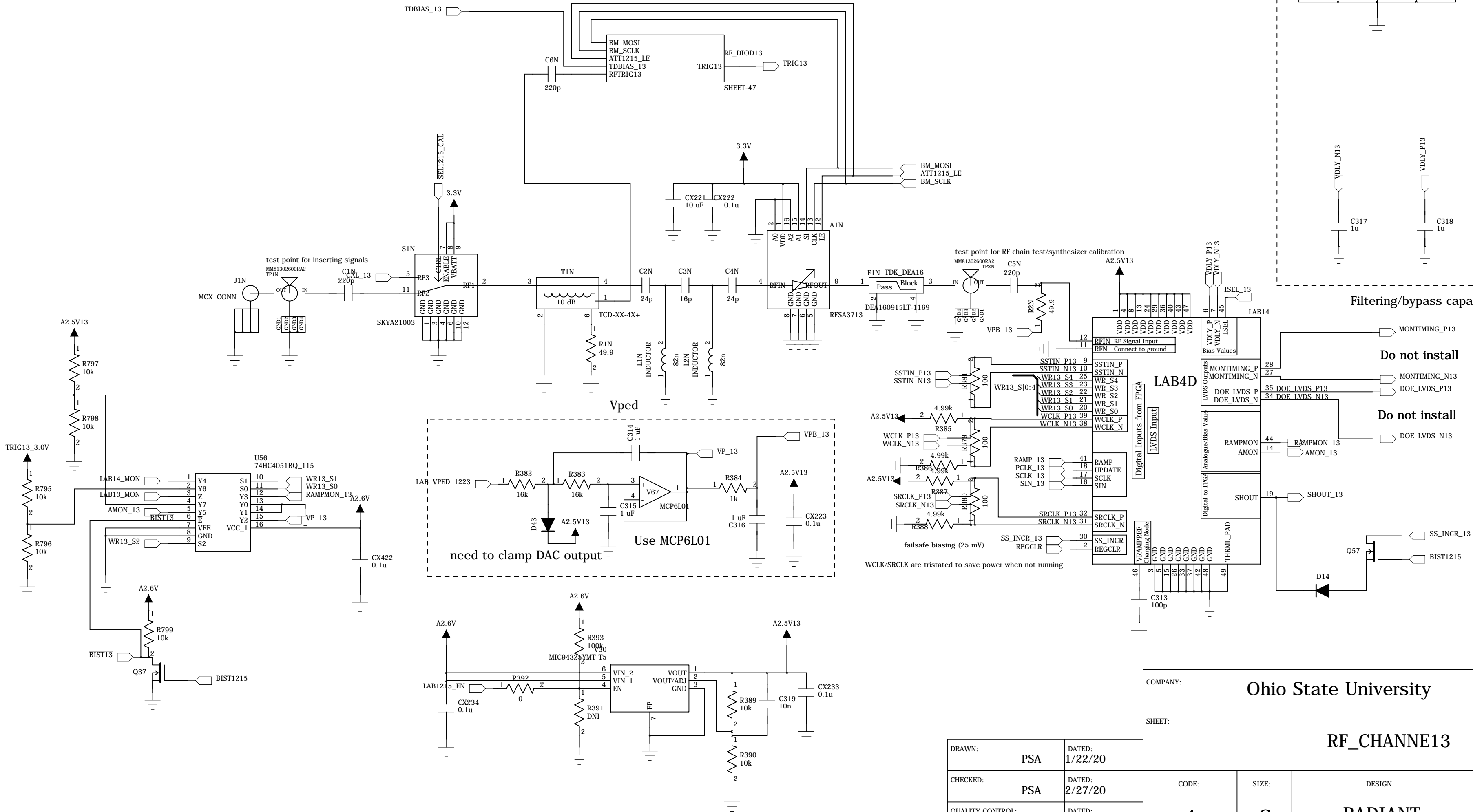
B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



Filtering/bypass capacitors



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE13 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 46 74 | |

6

5

4

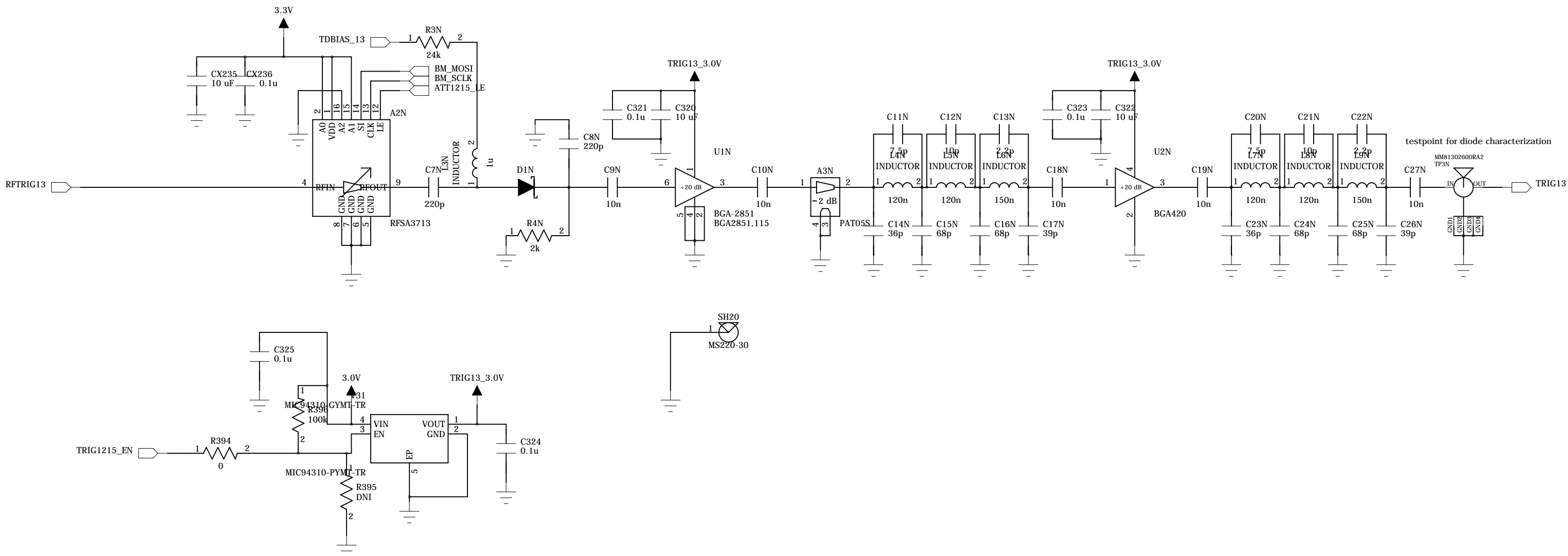
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIOD13 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 47 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

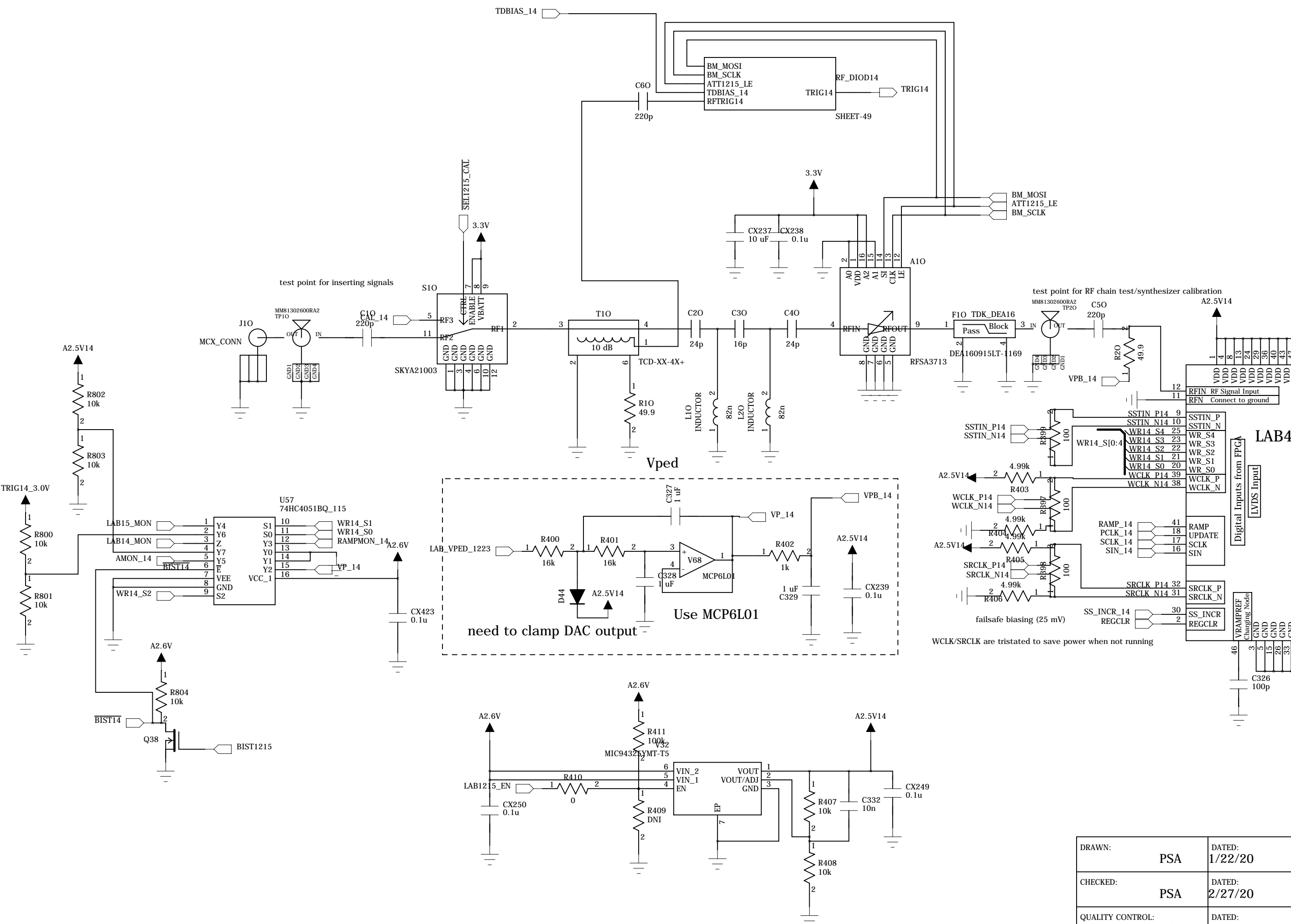
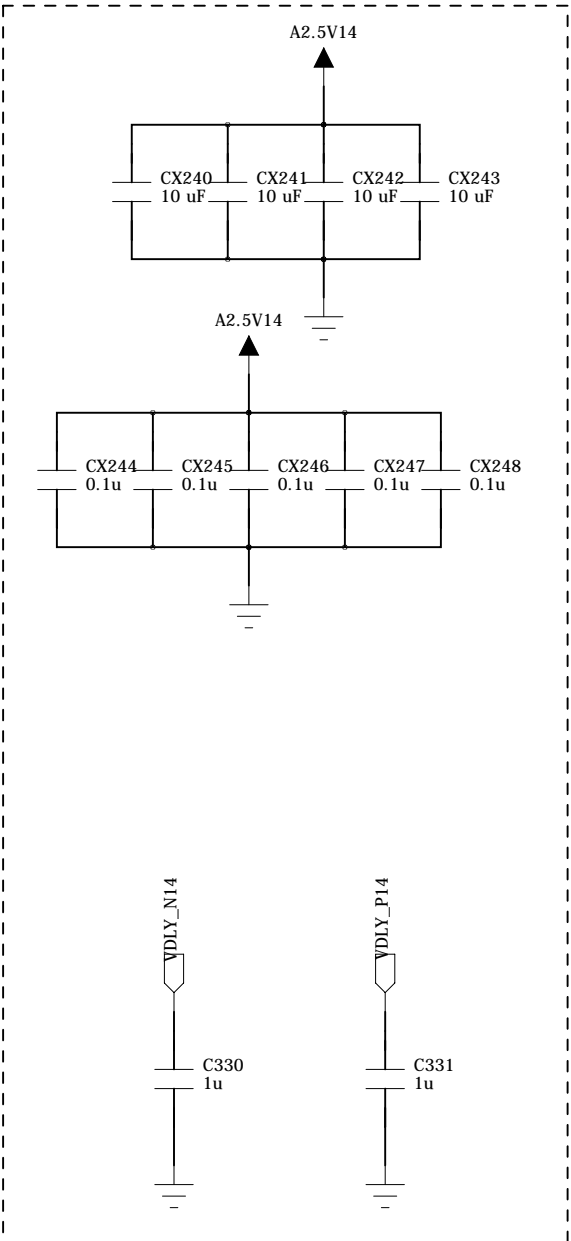
4

3

2

1

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE14 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 48 74 | |

6

5

4

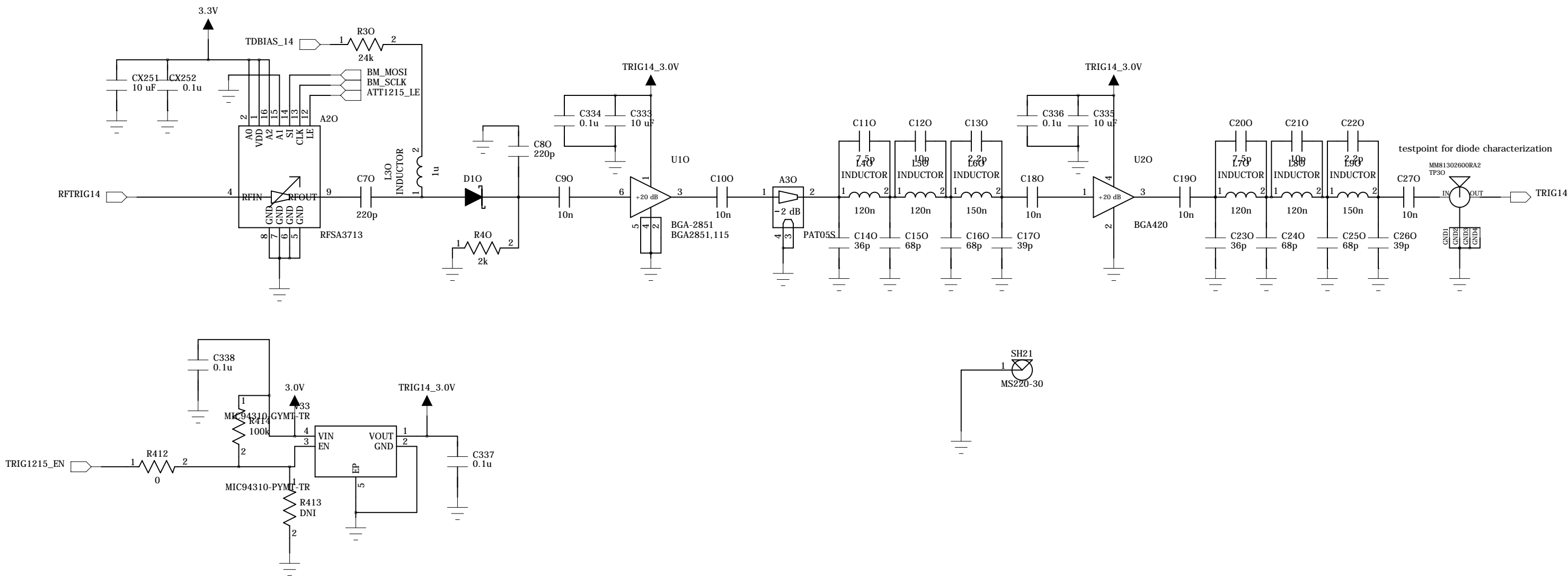
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIOD14 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 49 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

3

2

1

D

C

B

A

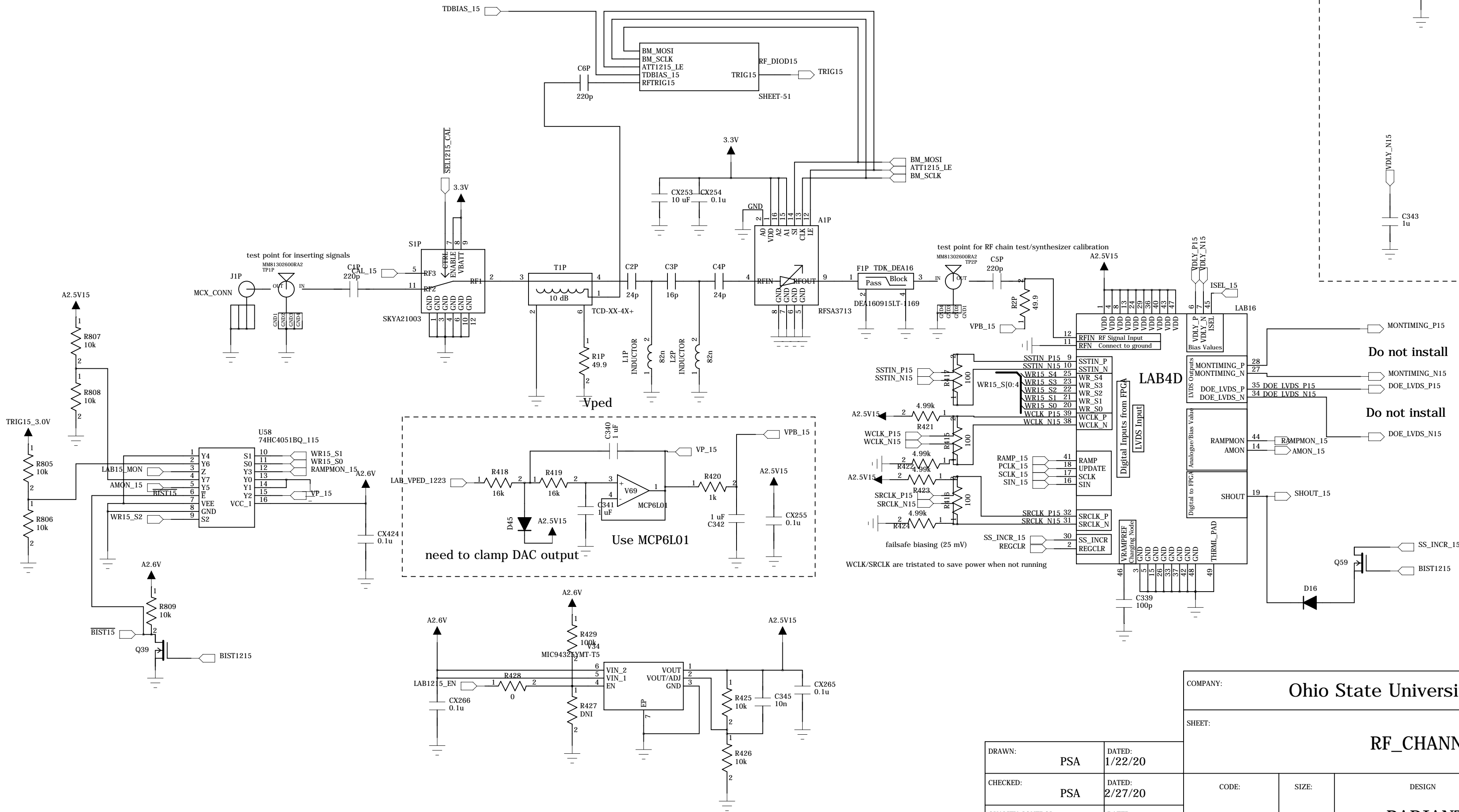
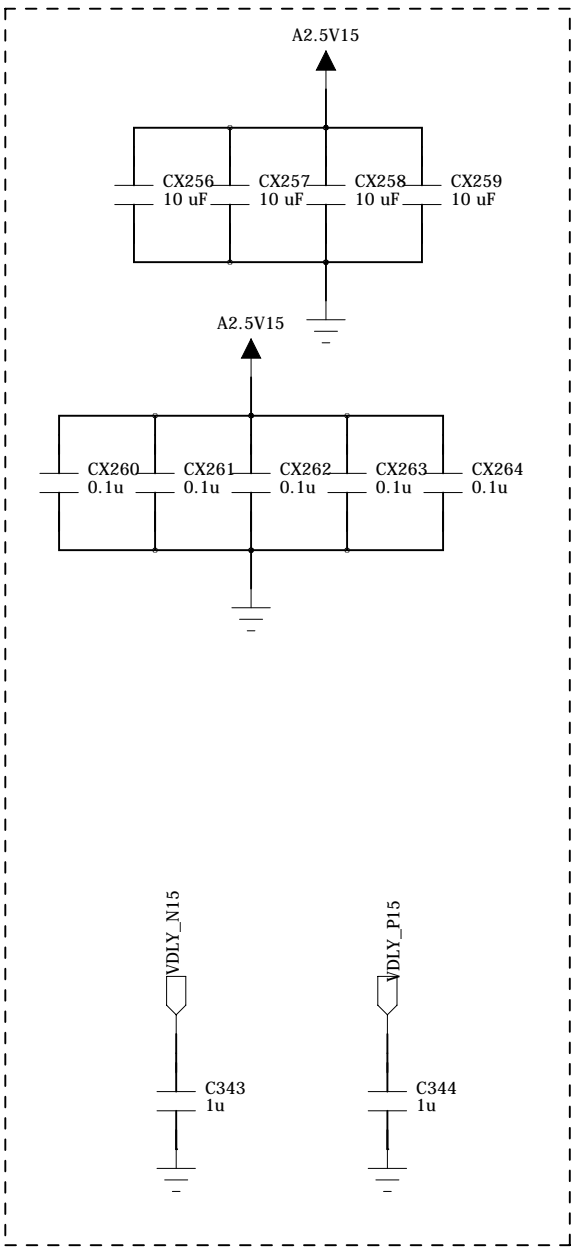
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE15 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 50 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

3

2

1

D

C

B

A

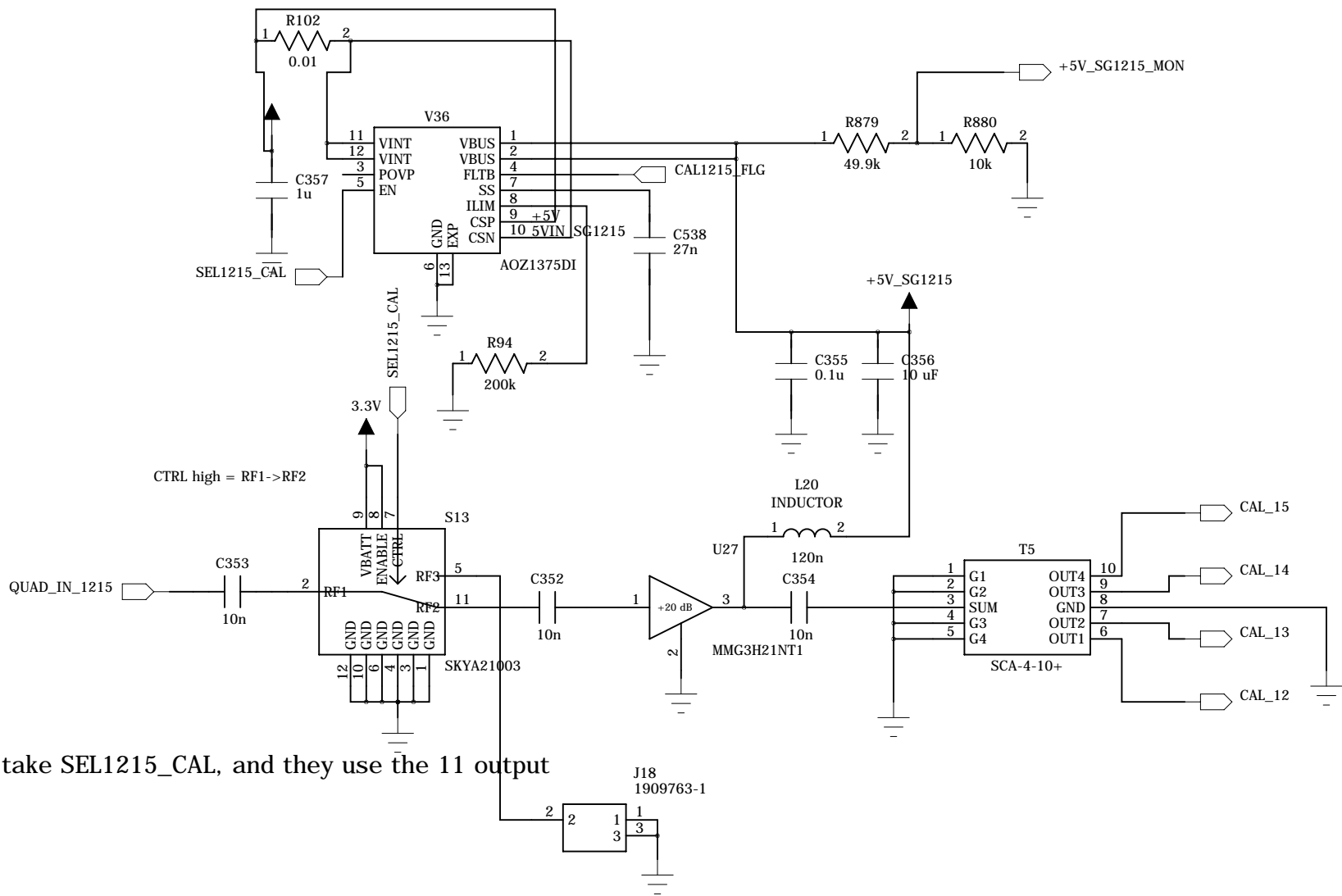
D

C

B

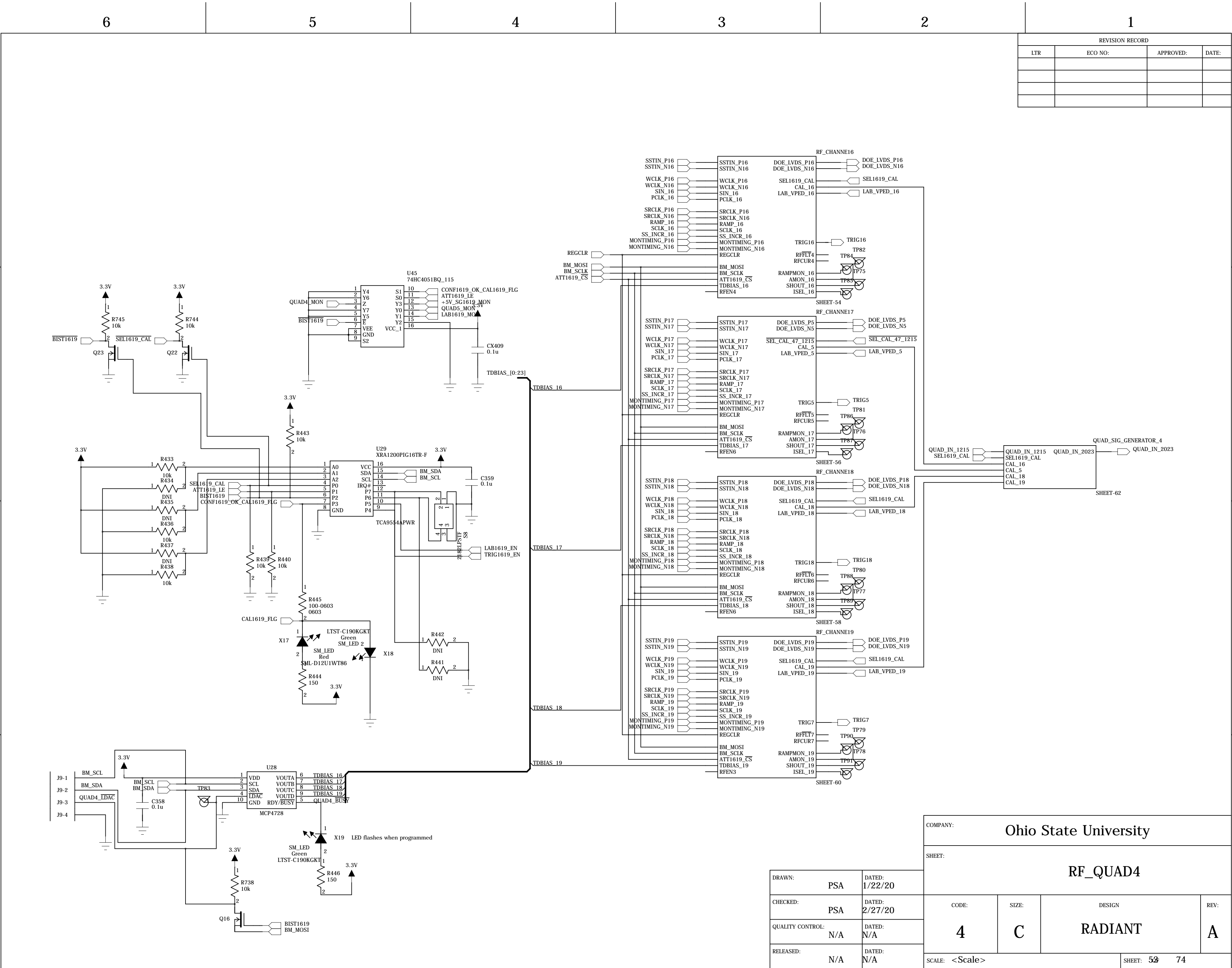
A

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|--------------------------------|-------|---------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: QUAD_SIG_GENERATOR_3 | | | |
| CODE: | SIZE: | DESIGN: | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | | SHEET: 52 74 |



| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_QUAD4 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 58 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

3

2

1

D

C

B

A

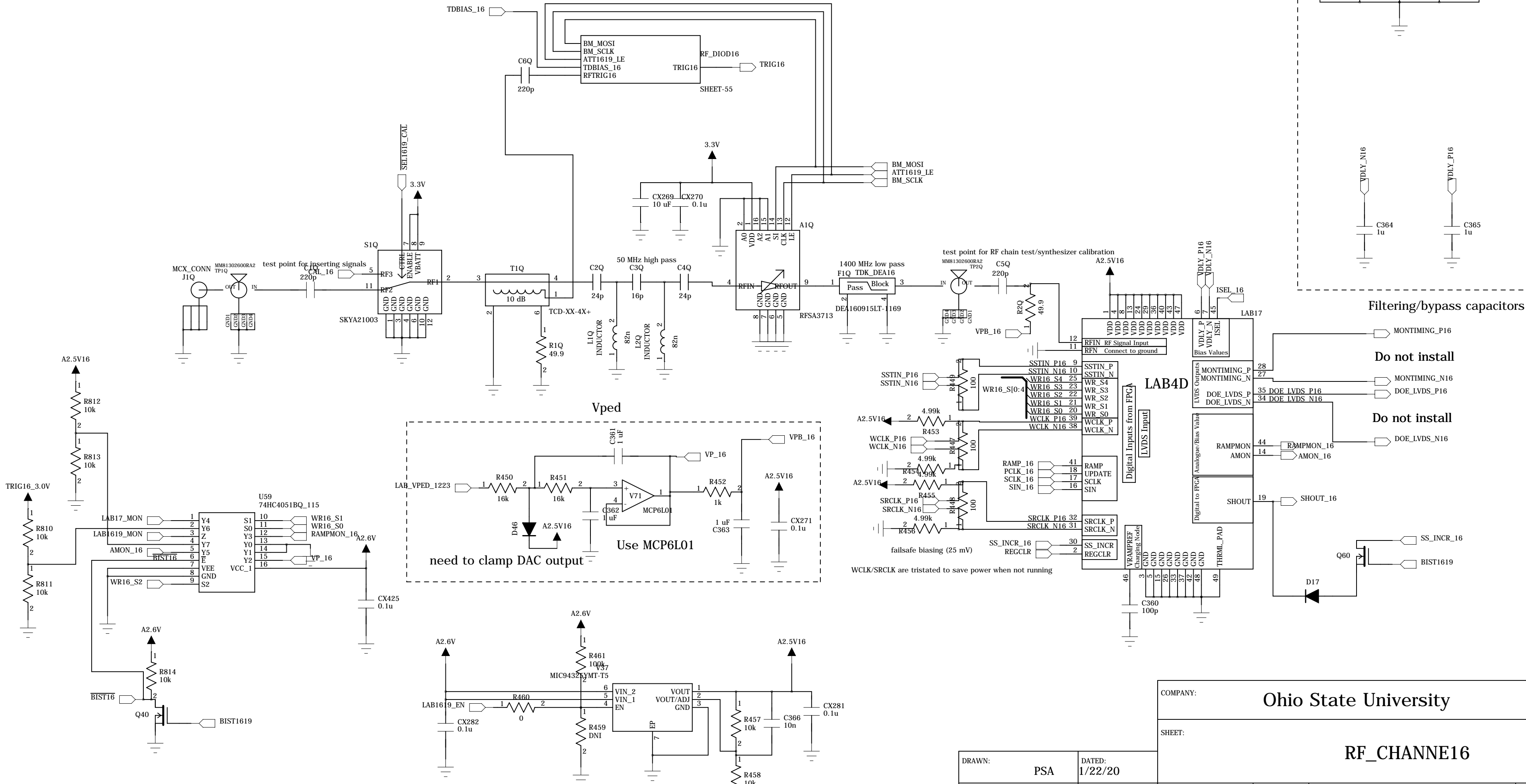
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE16 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 54 74 | |

6

5

4

3

2

1

D

C

B

A

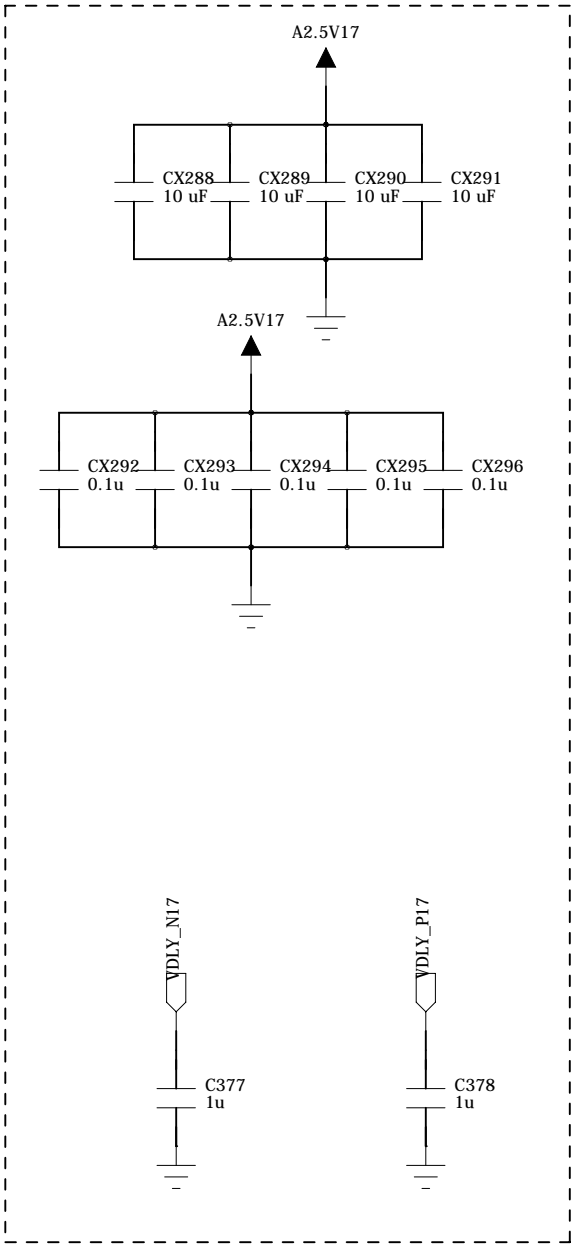
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |

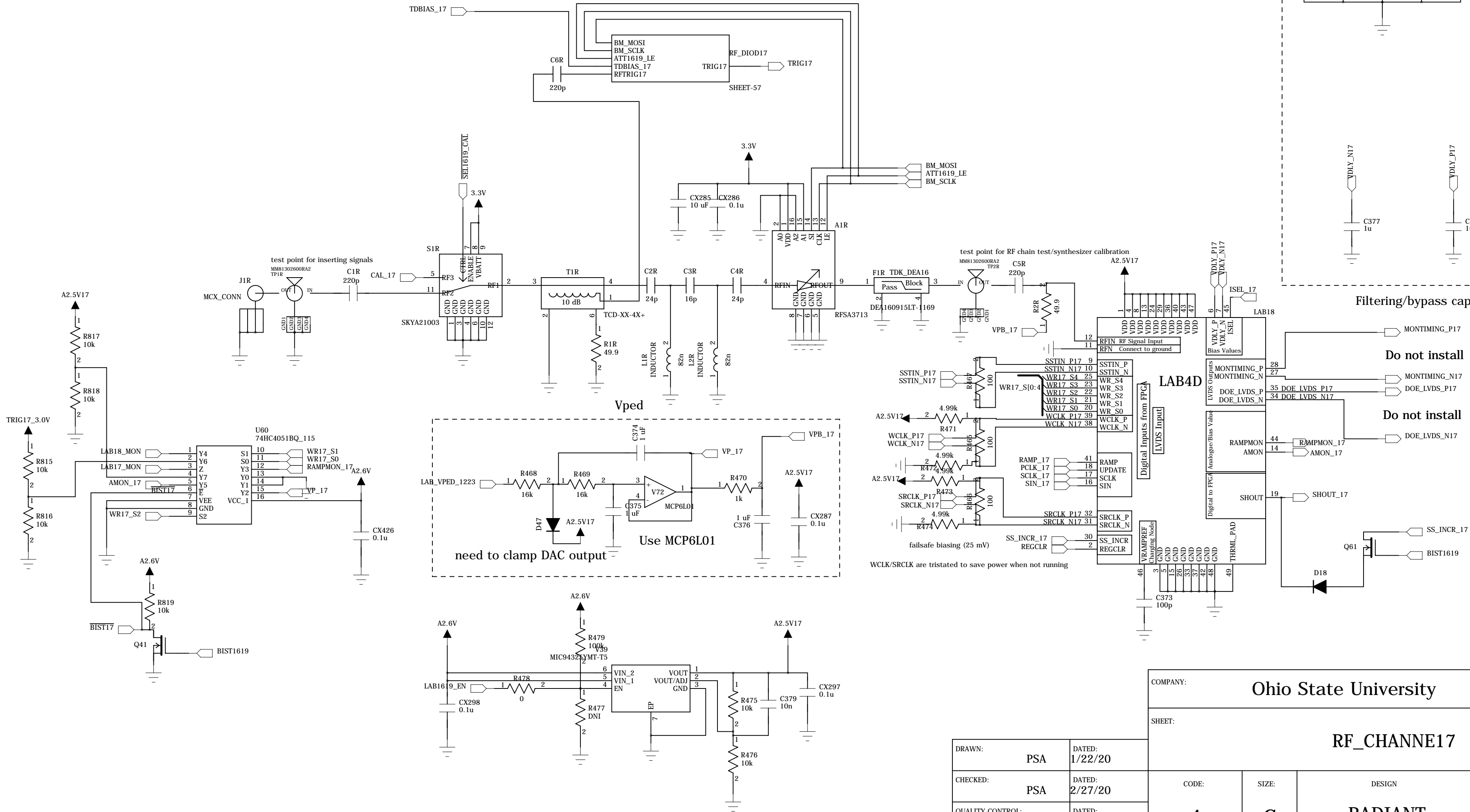


Filtering/bypass capacitors

Do not install

Do not install

| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE17 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 56 74 | |



6

5

4

3

2

1

D

C

B

A

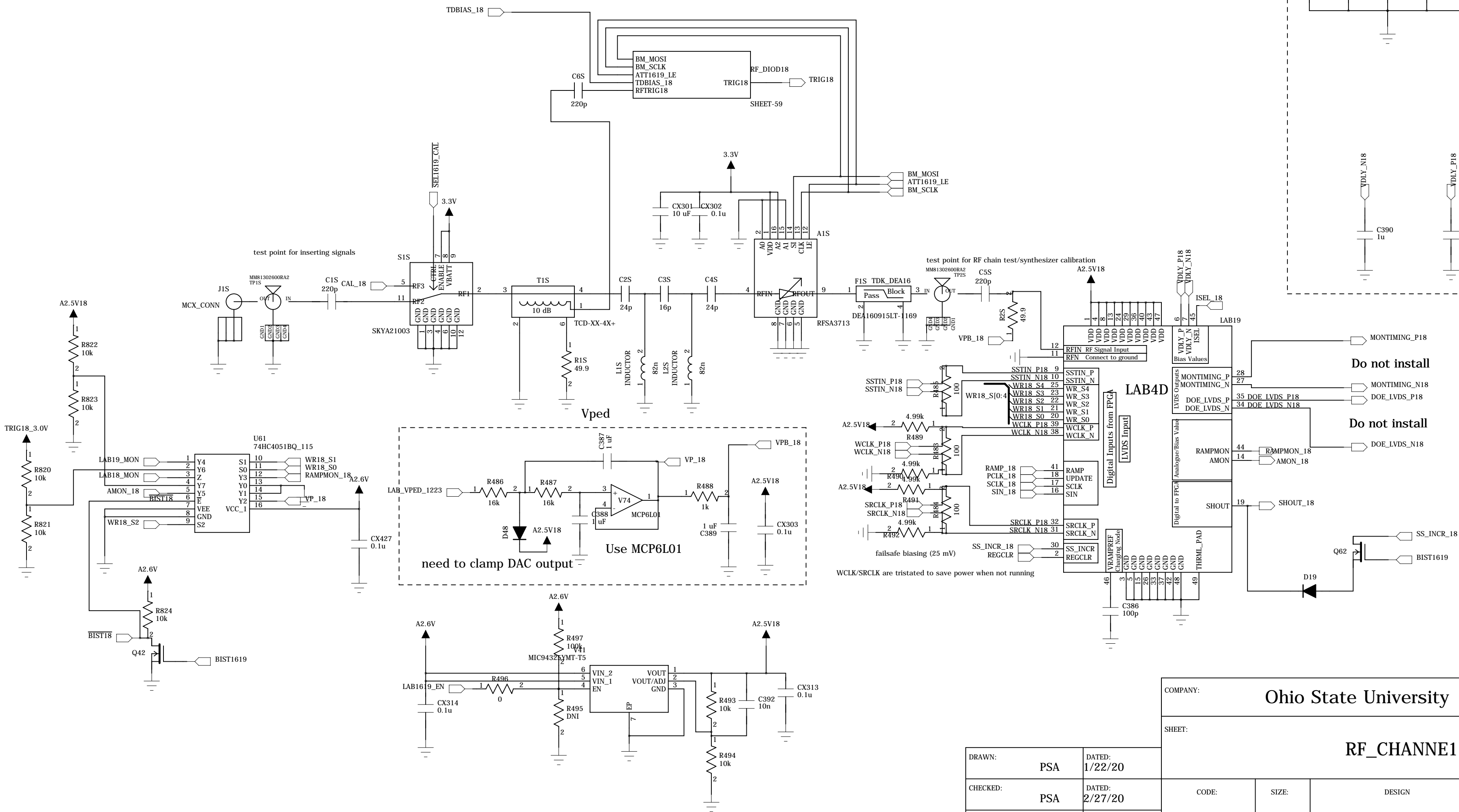
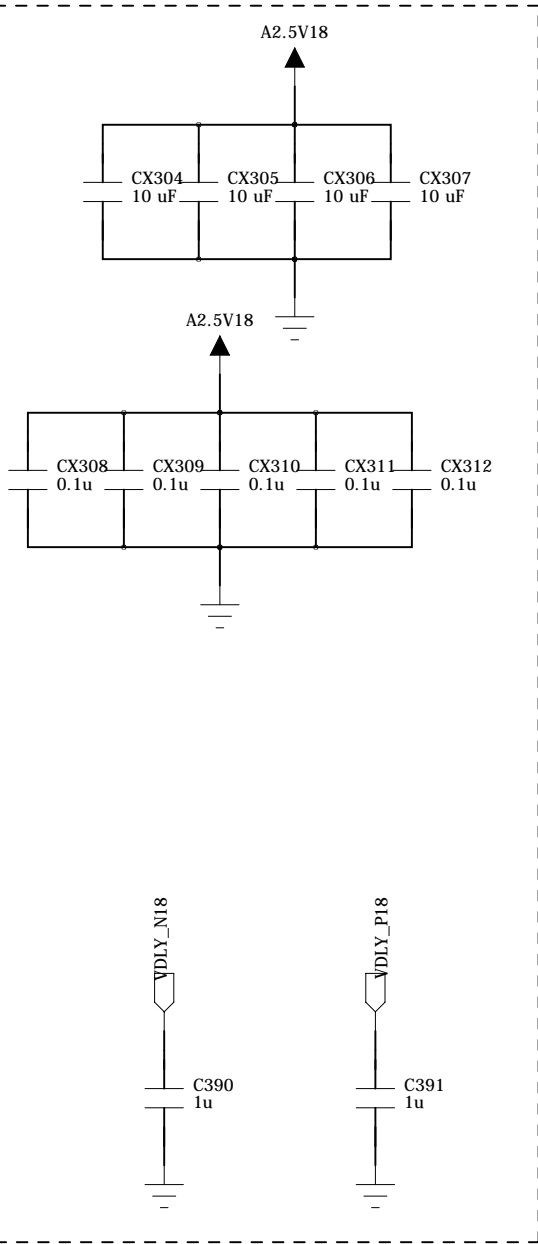
D

C

B

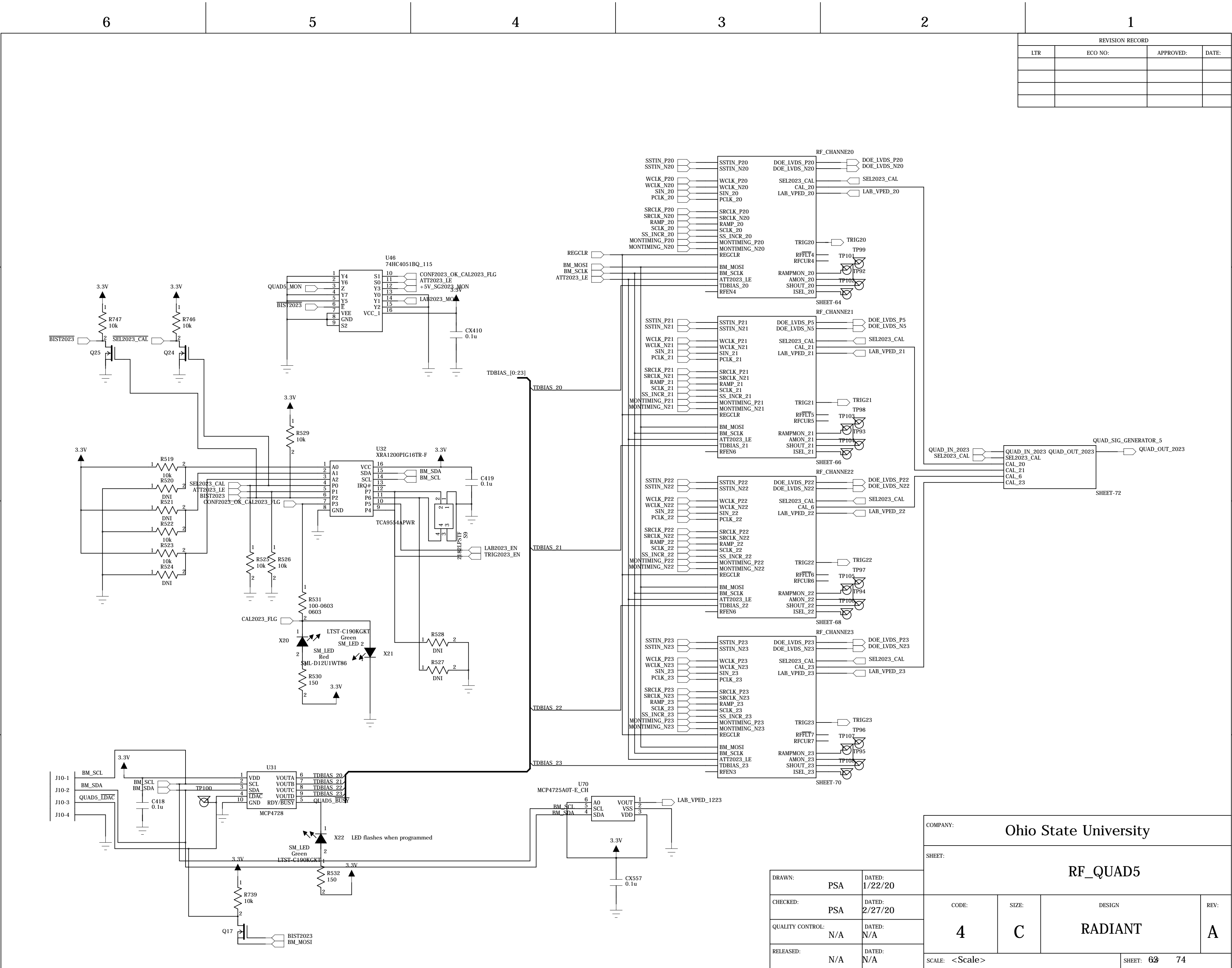
A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE18 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 58 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |



6

5

4

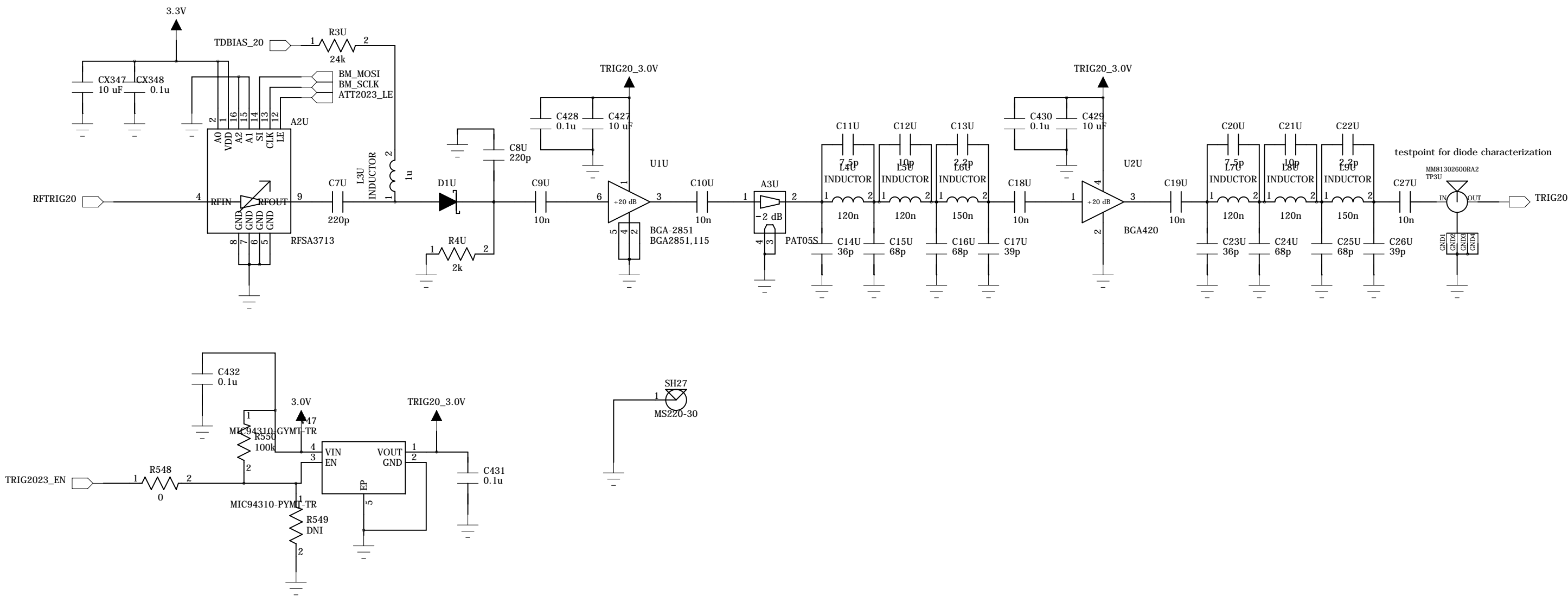
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIOD20 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 65 74 |

6

5

4

3

2

1

D

C

B

A

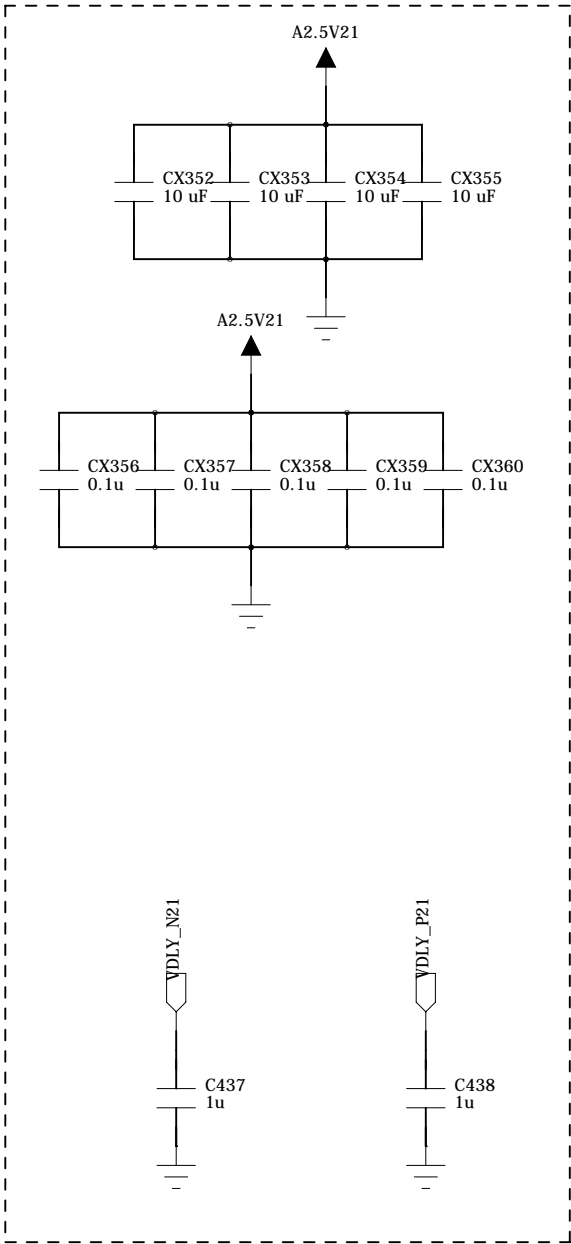
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



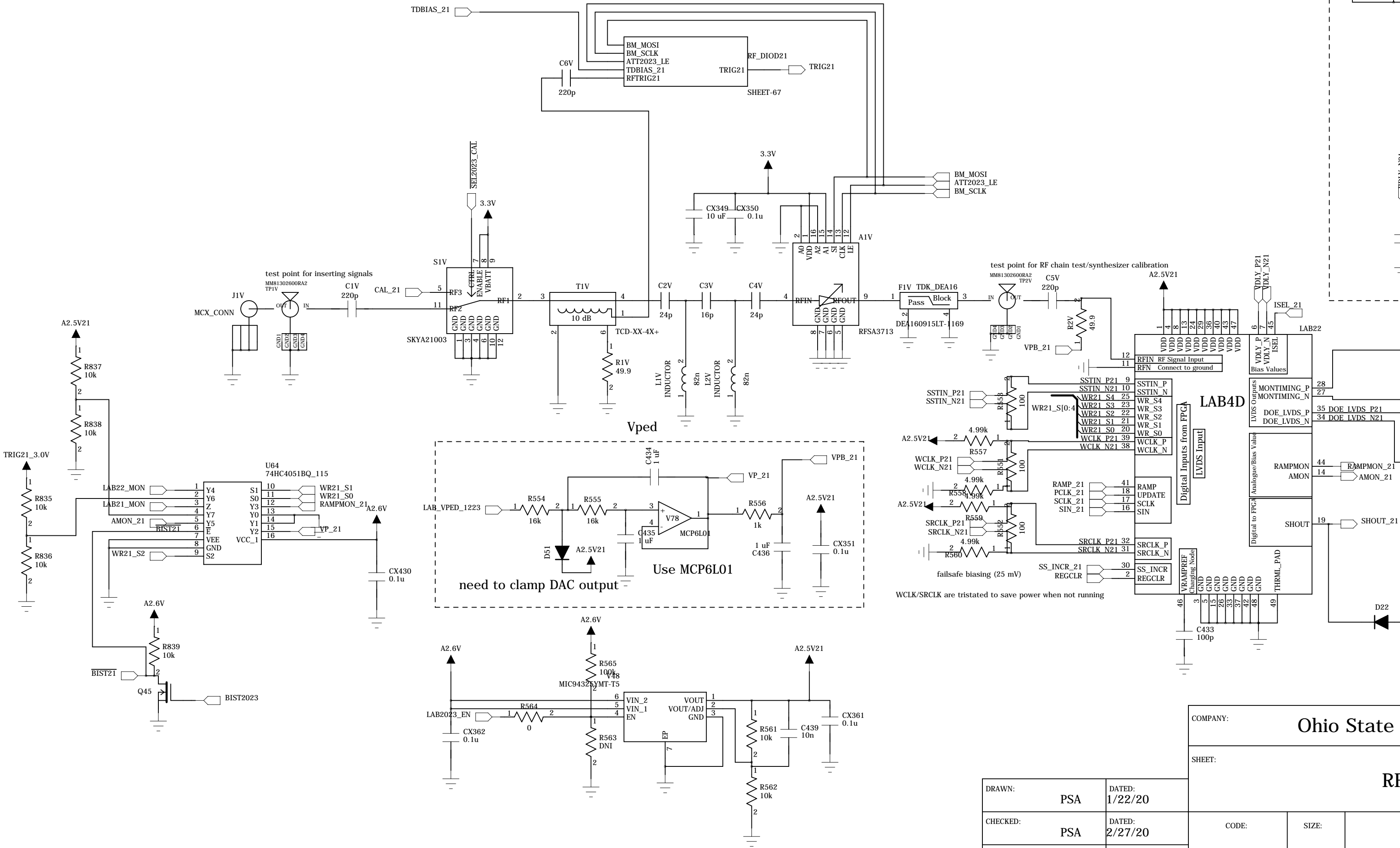
Filtering/bypass capacitors

Do not install

Do not install

| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE21 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 66 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |



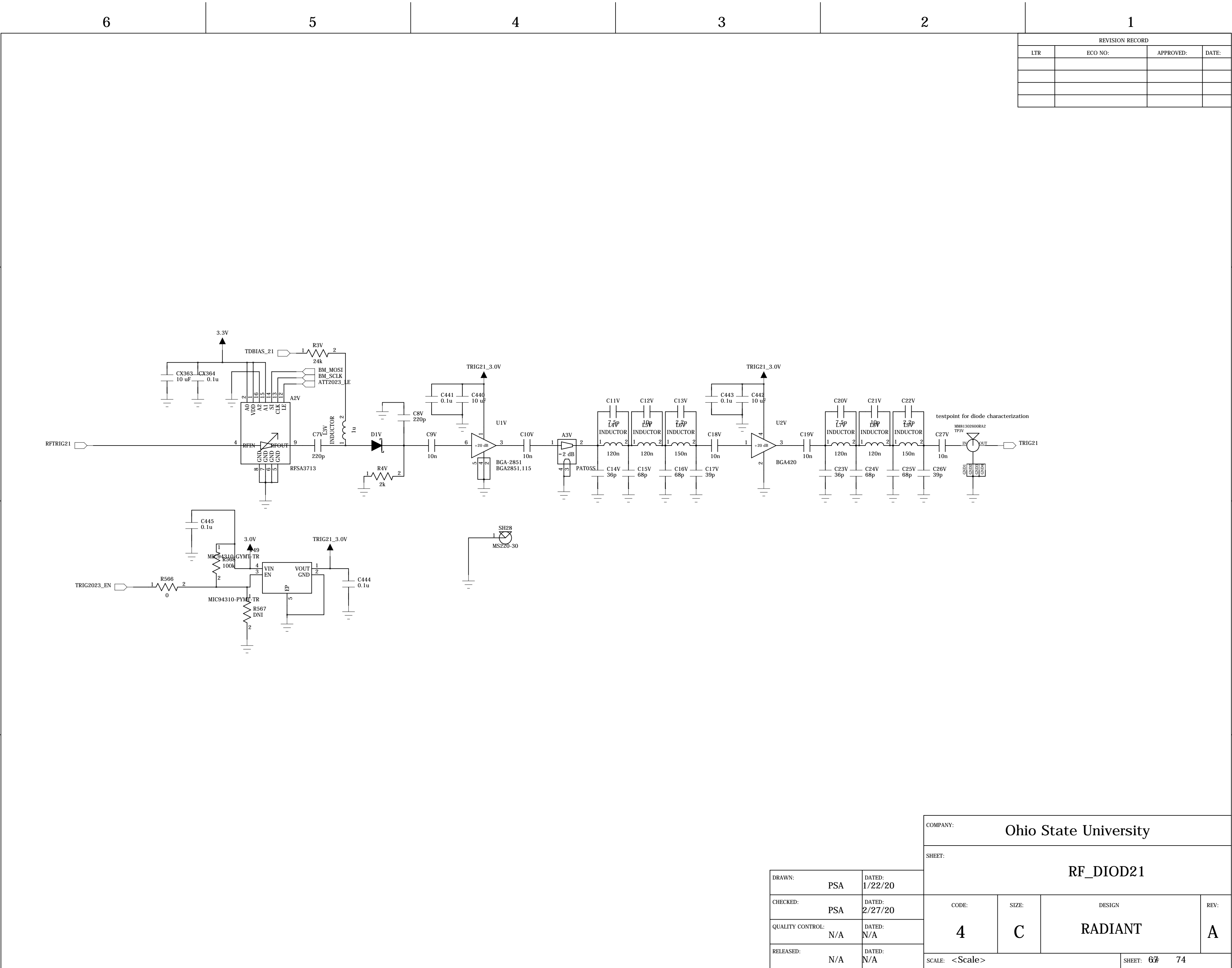
Vped

Use MCP6L01

need to clamp DAC output

LAB4D

WCLK/SRCLK are tristated to save power when not running



| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |

| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIOD21 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 67 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

3

2

1

D

C

B

A

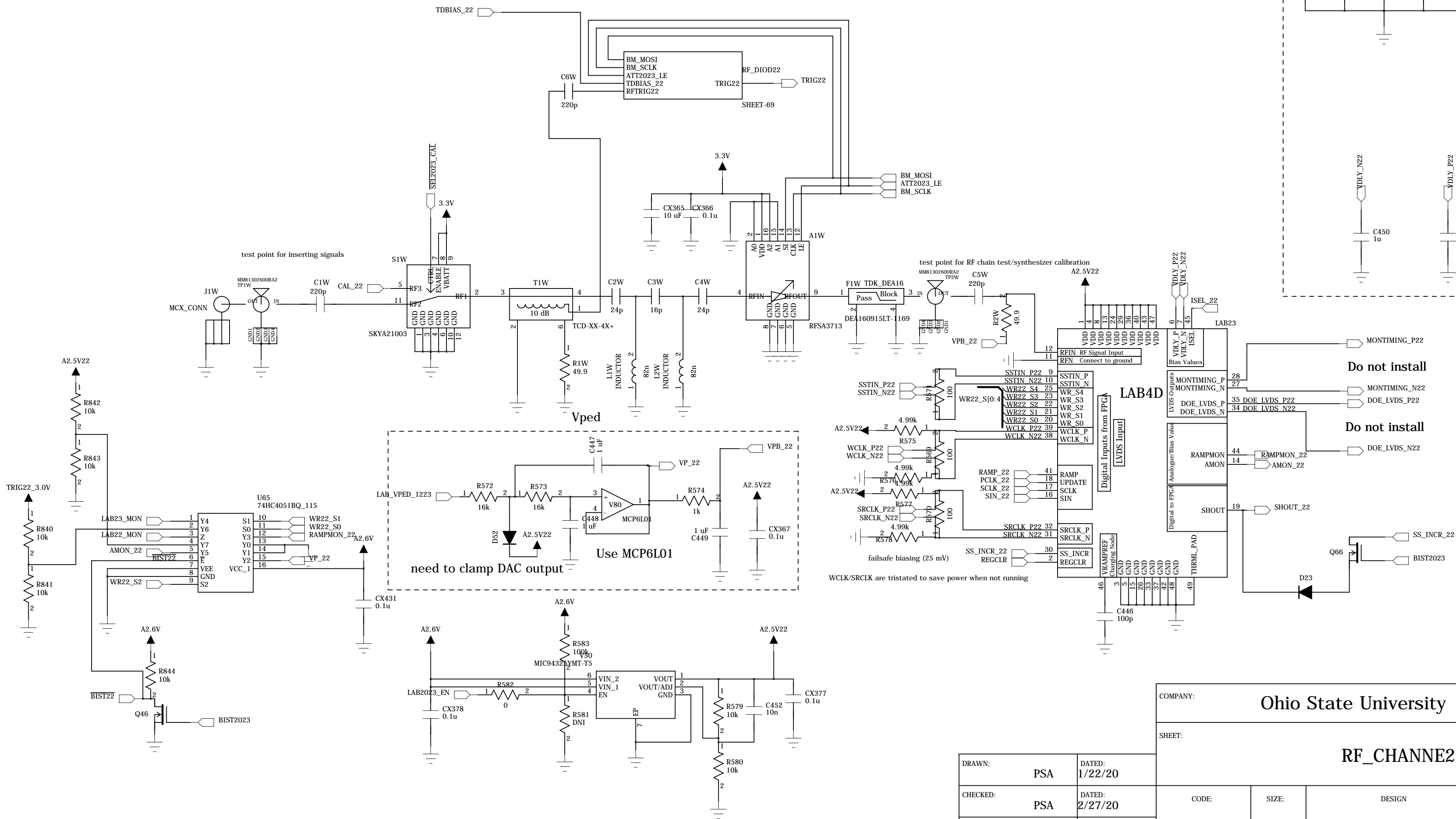
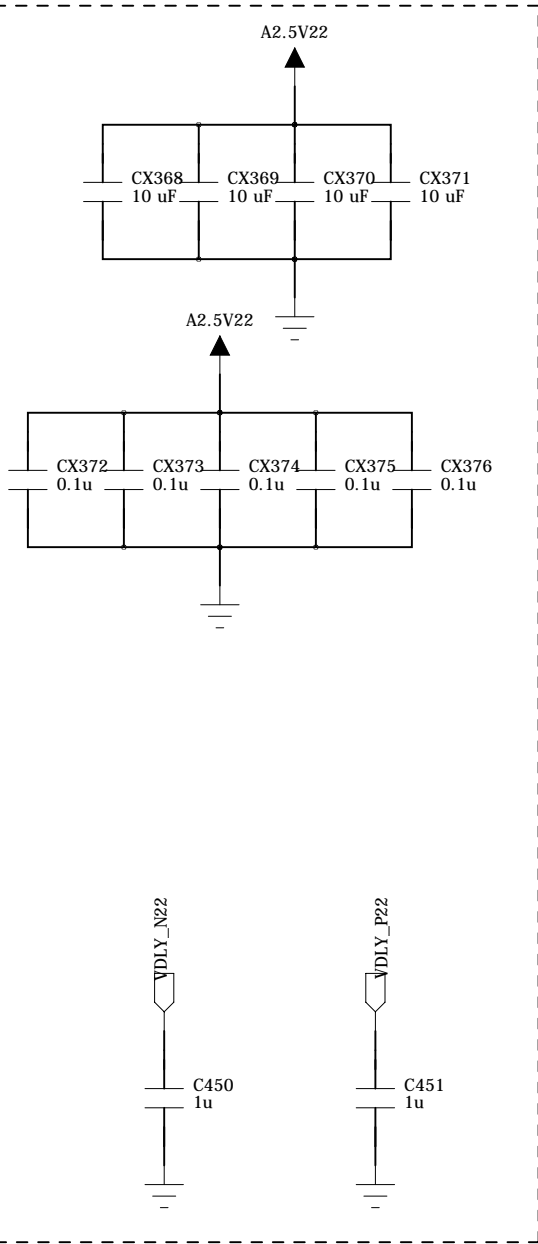
D

C

B

A

| REVISION RECORD | | | |
|-----------------------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| Filtering/bypass capacitors | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_CHANNE22 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 68 74 |

| | |
|----------------------|----------------|
| DRAWN: PSA | DATED: 1/22/20 |
| CHECKED: PSA | DATED: 2/27/20 |
| QUALITY CONTROL: N/A | DATED: N/A |
| RELEASED: N/A | DATED: N/A |

6

5

4

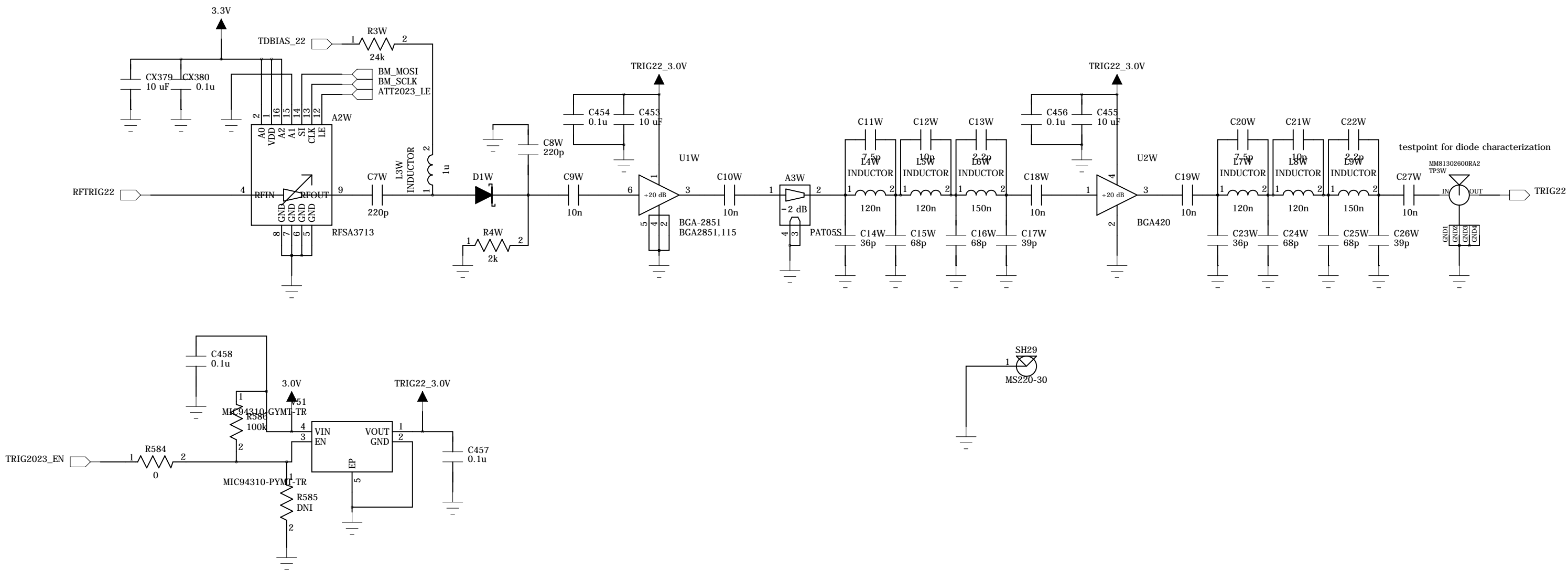
3

2

1

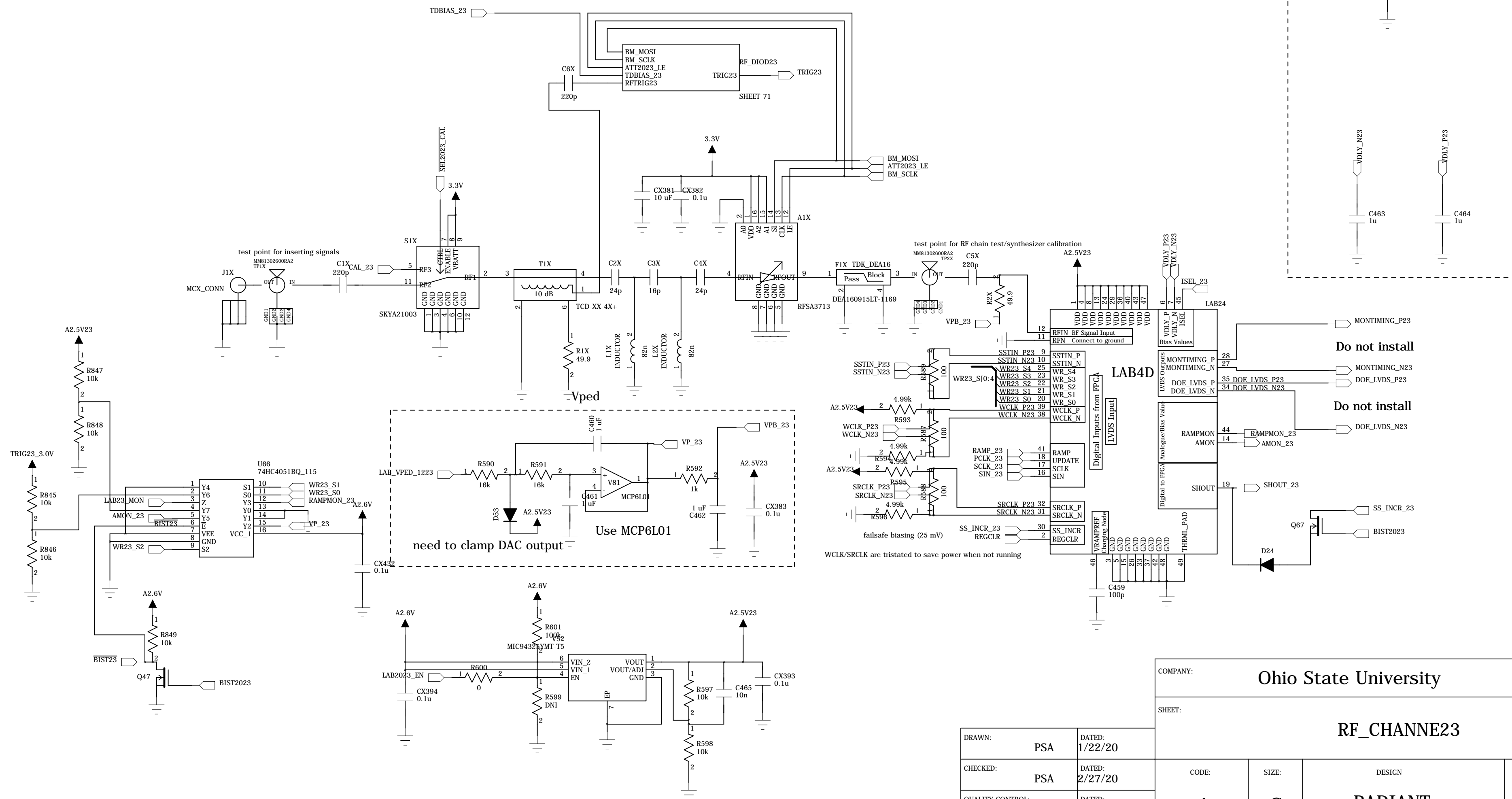
REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|---------|-----------------|--------------|
| COMPANY: Ohio State University | | | |
| SHEET: RF_DIOD22 | | | |
| CODE: 4 | SIZE: C | DESIGN: RADIANT | REV: A |
| SCALE: <Scale> | | | SHEET: 69 74 |

| REVISION RECORD | | | |
|-----------------|-----------------------------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | Filtering/bypass capacitors | | |



| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|----------------|-------|-----------------------|------|
| COMPANY: | | Ohio State University | |
| SHEET: | | | |
| RF_CHANNE23 | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | SHEET: 70 74 | |

6

5

4

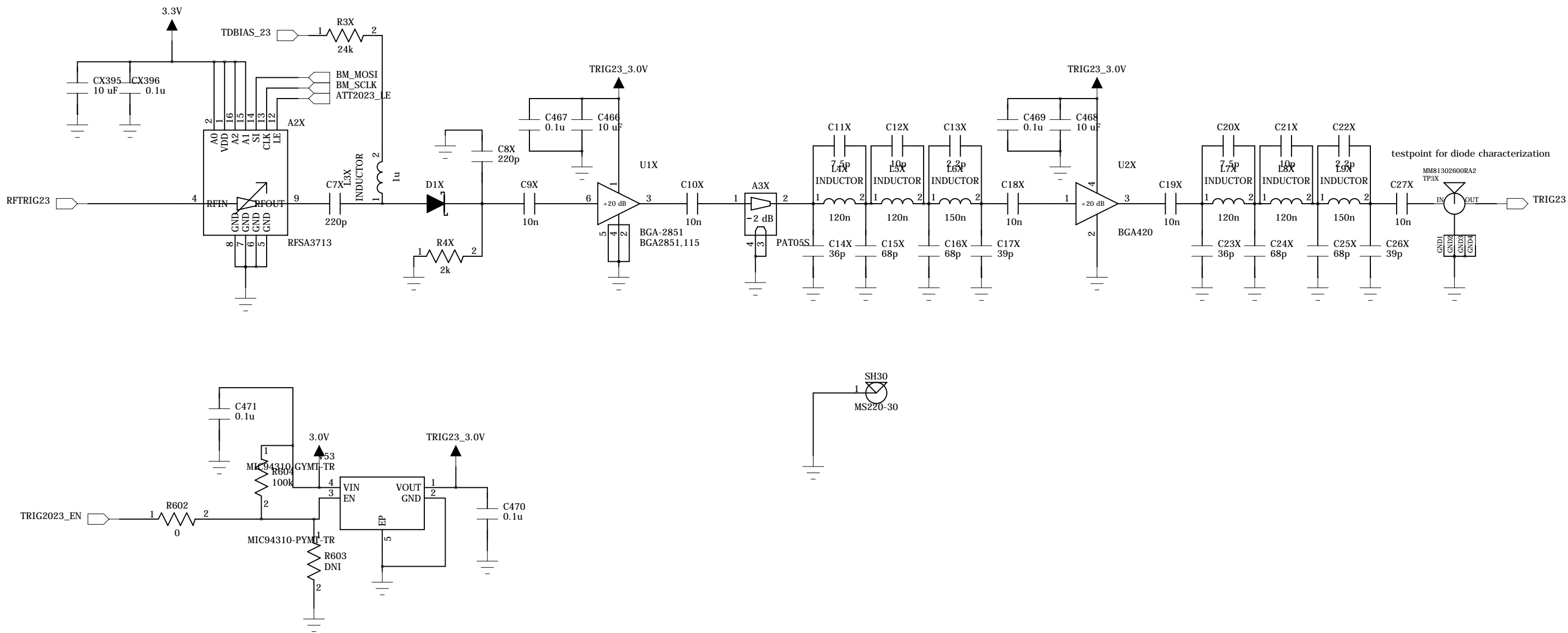
3

2

1

REVISION RECORD

| LTR | ECO NO: | APPROVED: | DATE: |
|-----|---------|-----------|-------|
| | | | |
| | | | |
| | | | |
| | | | |



COMPANY:

Ohio State University

SHEET:

RF_DIOD23

| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

CODE:

4

SIZE:

C

DESIGN

RADIANT

REV:

A

SCALE: <Scale>

SHEET: 74 of 74

6

5

4

3

2

1

D

C

B

A

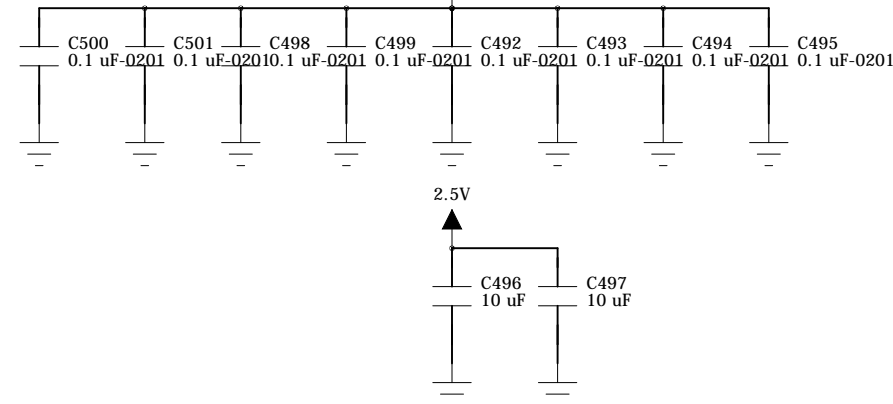
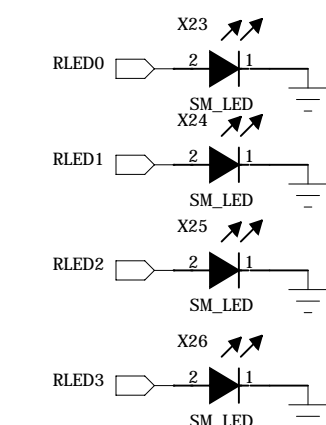
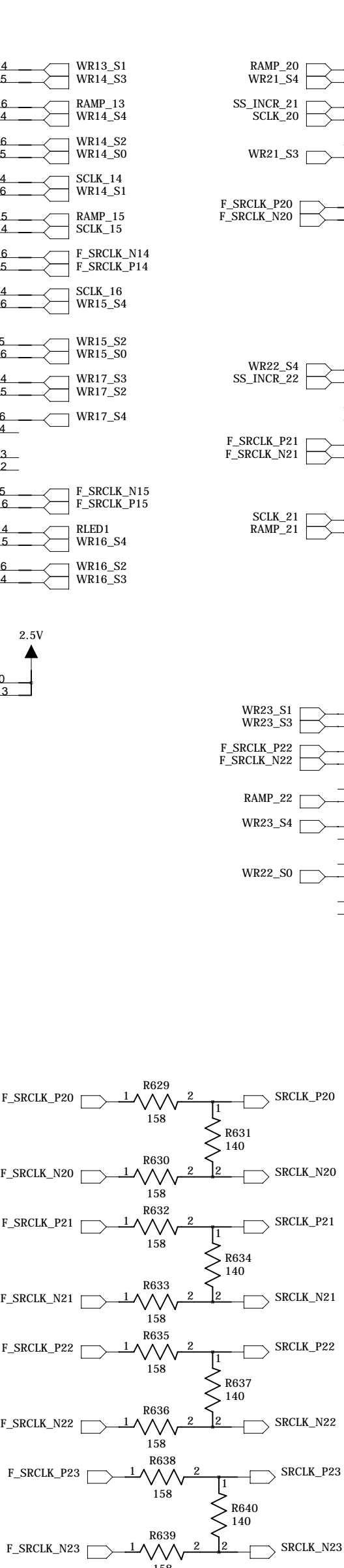
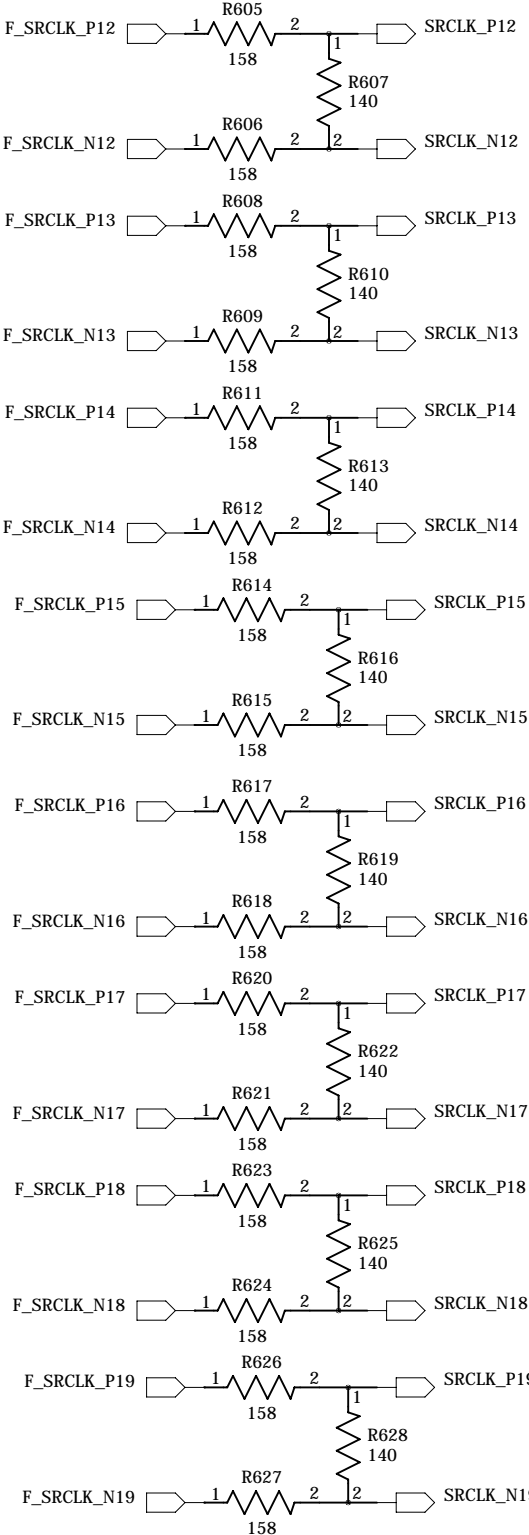
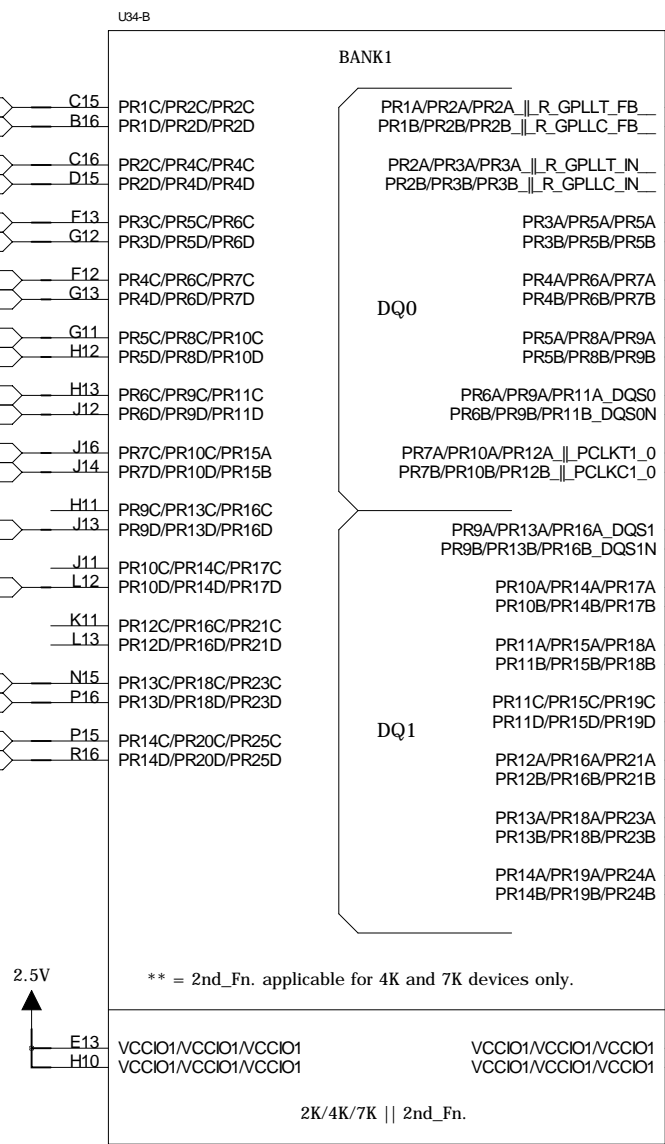
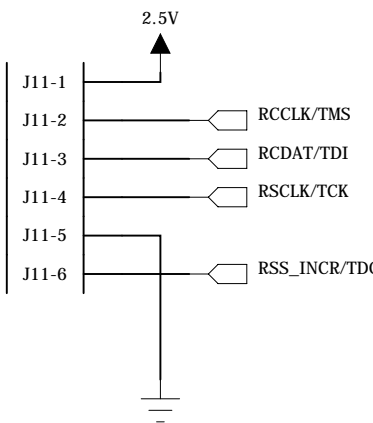
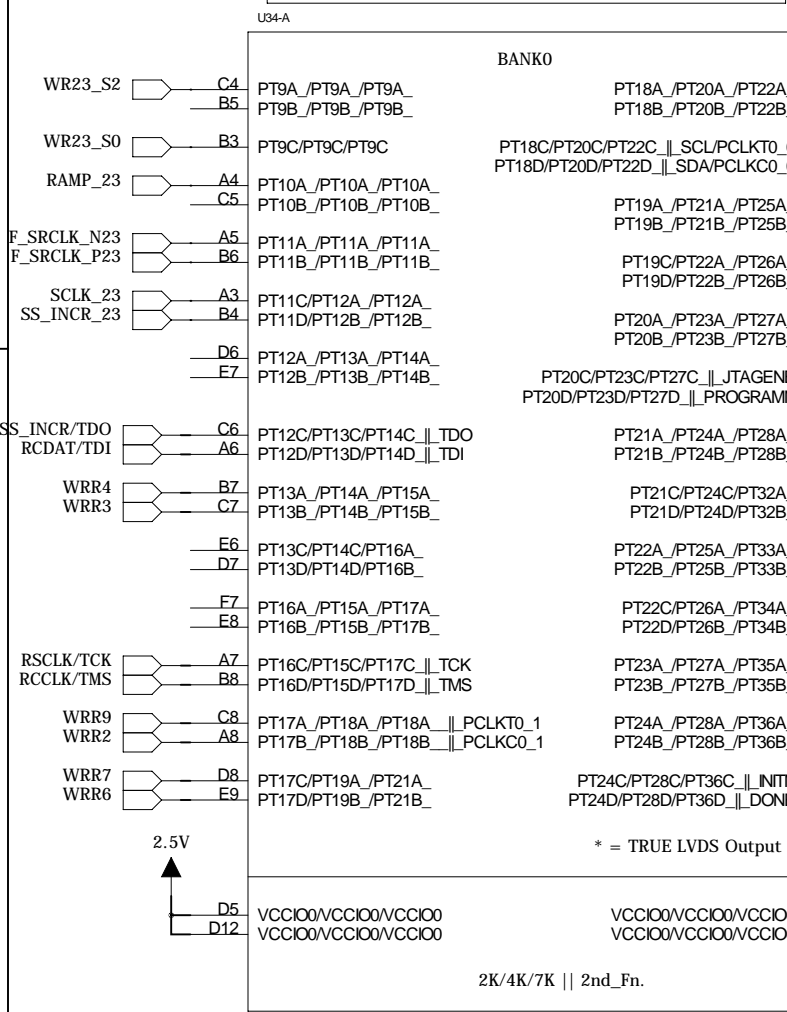
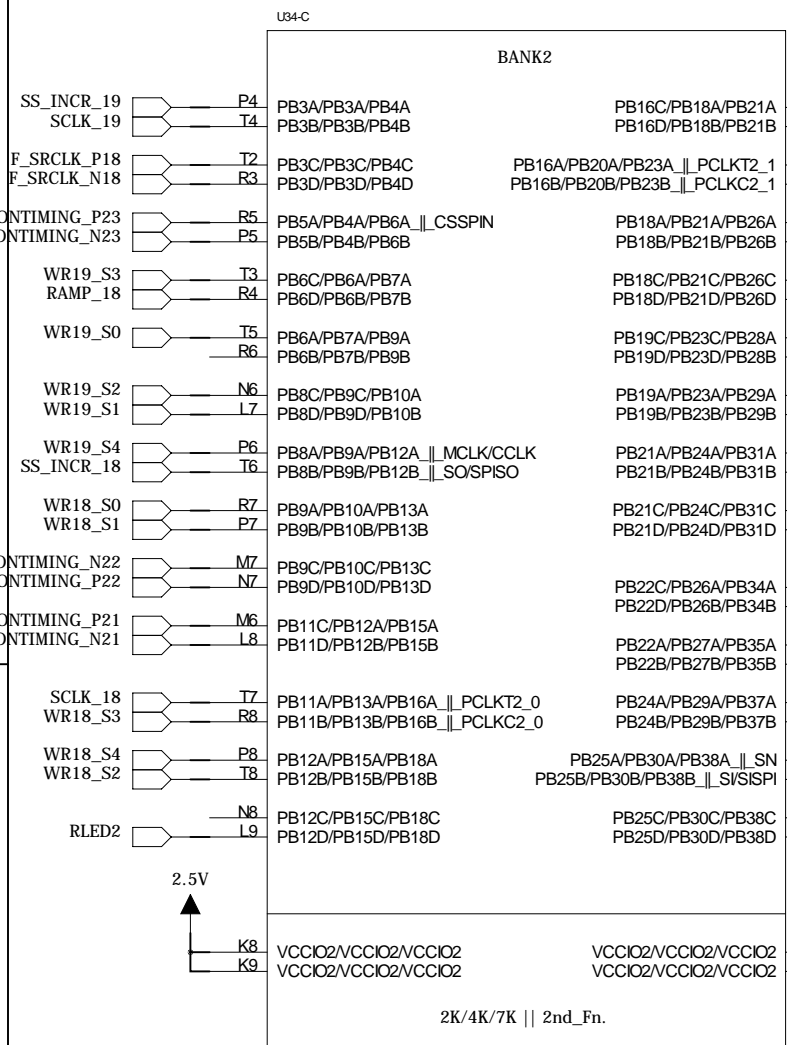
D

C

B

A

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |
| | | | |



| | | | |
|--------------------------------|----------------|-----------------|---------|
| COMPANY: Ohio State University | | | |
| SHEET: | | | |
| AUX_CPLD1 | | | |
| DRAWN: PSA | DATED: 1/22/20 | CODE: 4 | SIZE: C |
| CHECKED: PSA | DATED: 2/27/20 | DESIGN: RADIANT | REV: A |
| QUALITY CONTROL: N/A | DATED: N/A | SCALE: <Scale> | |
| RELEASED: N/A | DATED: N/A | SHEET: 73 74 | |

6

5

4

3

2

1

D

C

B

A

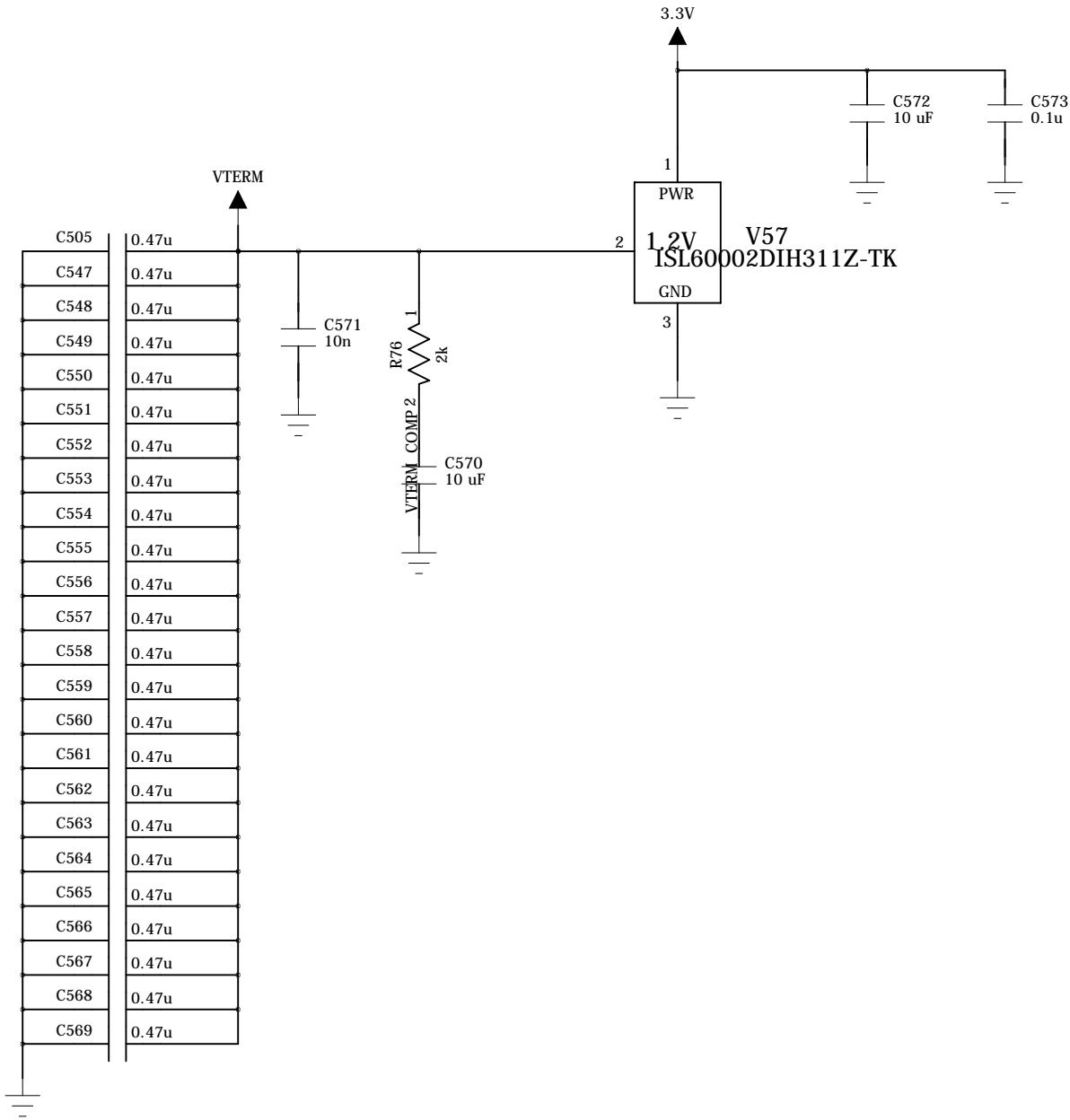
D

C

B

A

| REVISION RECORD | | | |
|-----------------|---------|-----------|-------|
| LTR | ECO NO: | APPROVED: | DATE: |
| | | | |
| | | | |
| | | | |



| | | | |
|------------------|-----|--------|---------|
| DRAWN: | PSA | DATED: | 1/22/20 |
| CHECKED: | PSA | DATED: | 2/27/20 |
| QUALITY CONTROL: | N/A | DATED: | N/A |
| RELEASED: | N/A | DATED: | N/A |

| | | | |
|----------------|-------|-----------------------|------|
| COMPANY: | | Ohio State University | |
| SHEET: | | | |
| VTERM | | | |
| CODE: | SIZE: | DESIGN | REV: |
| 4 | C | RADIANT | A |
| SCALE: <Scale> | | SHEET: 74 | 74 |