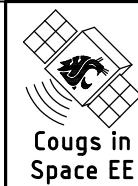
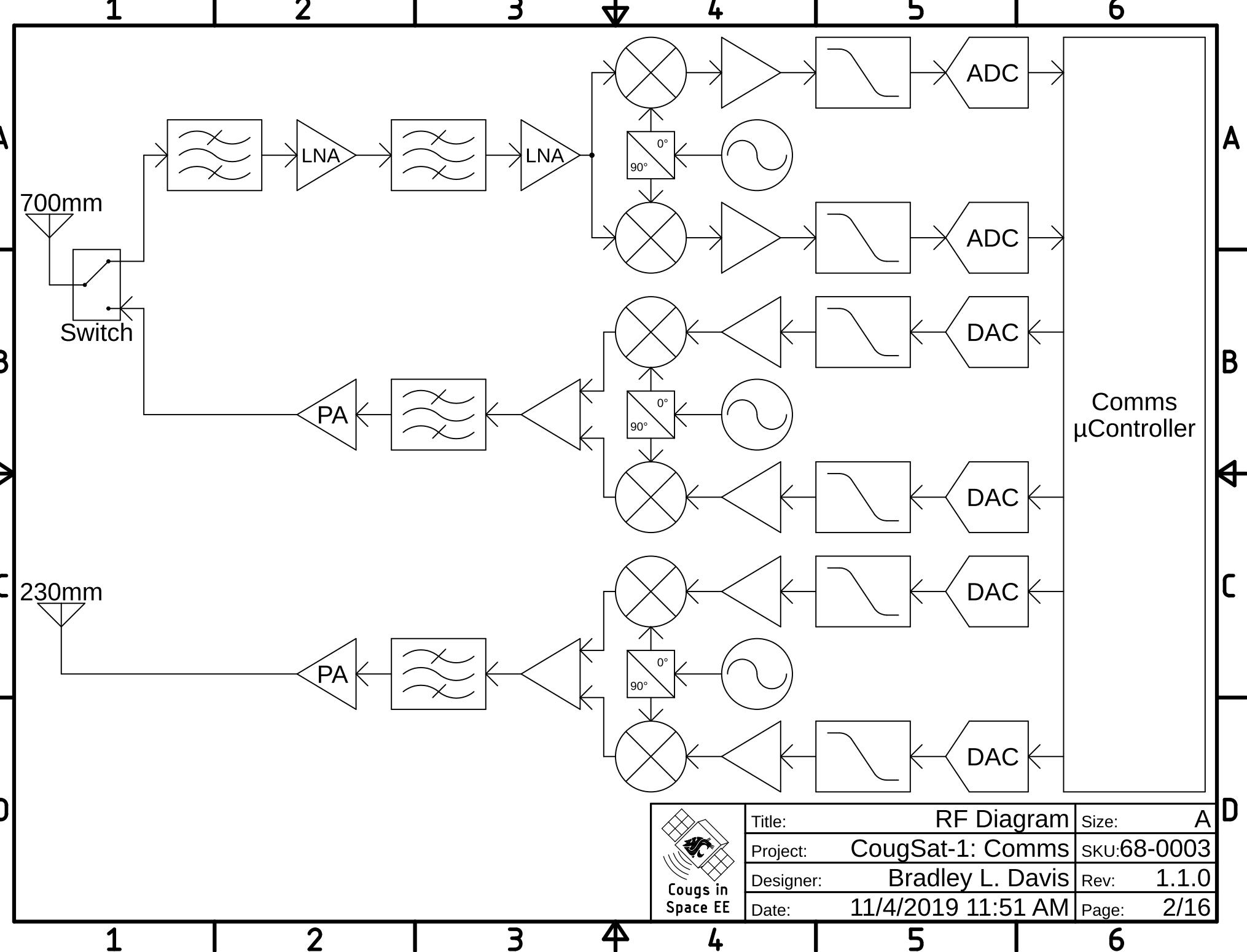


Page 1: Block Diagram  
 Page 2: RF Diagram  
 Page 3: Power Rails  
 Page 4: µController  
 Page 5: ADCs  
 Page 6: Regulators  
 Page 7: Power Switching & LDOs  
 Page 8: RF Clocks - 700mm  
 Page 9: RF Clock - 230mm

Page 10: Differential Drivers  
 Page 11: 230mm Downlink  
 Page 12: 700mm Downlink  
 Page 13: 700mm Downlink Amplifiers  
 Page 14: Demodulator  
 Page 15: Flash Memory  
 Page 16: Mechanical



Title:	Block Diagram	Size:	A
Project:	CougSat-1: Comms	SKU:	68-0003
Designer:	Bradley L. Davis	Rev:	1.1.0
Date:	11/4/2019 11:51 AM	Page:	1/16



1 | 2 | 3 | 4 | 5 | 6

A

Connector:  
Backplane  
From EPS

5V Boost  
Converter

PR\_BATT-6

PR\_3.3V-6

5.0V

$\mu$ Controller

25mA

SPI Flash

5mA

ADCs

5mA

700mm RX

RF Clock  
Generator

35mA

Demodulator

50mA

Low Noise  
Amplifier

20mA

700mm TX

RF Clock  
Generator

35mA

Modulator

20mA + 65mA

Power  
Amplifier

450mA

230mm TX

RF Clock  
Generator

35mA

Modulator

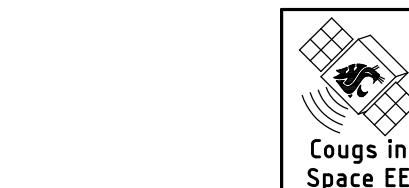
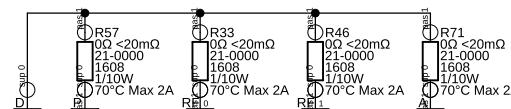
20mA + 45mA

Low Noise  
Amplifier

60mA

Power  
Amplifier

490mA



Title:

Power Rails

A

Project:

CougSat-1: Comms

SKU:68-0003

Designer:

Bradley L. Davis

Rev: 1.1.0

Date:

11/4/2019 11:51 AM

Page: 3/16

1

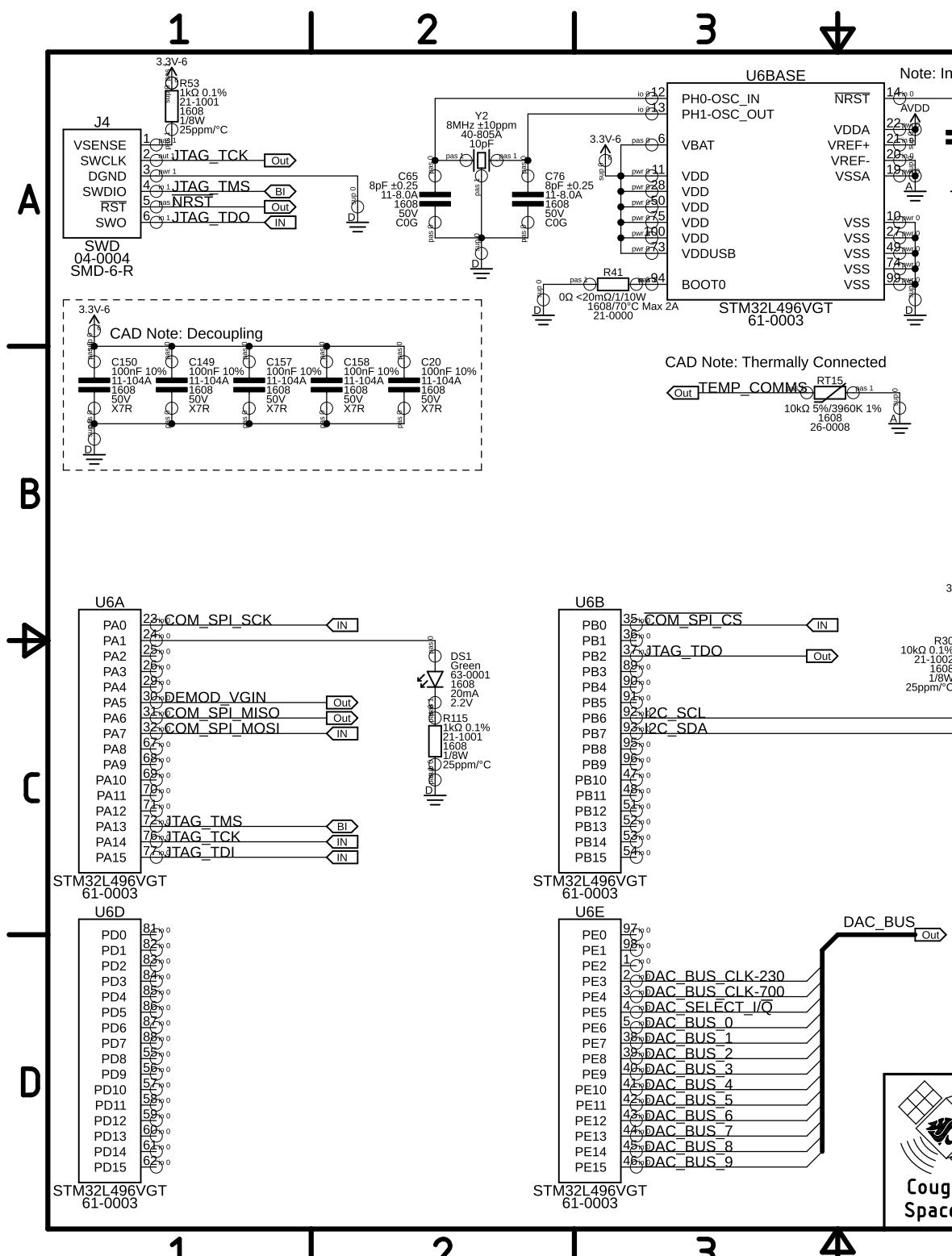
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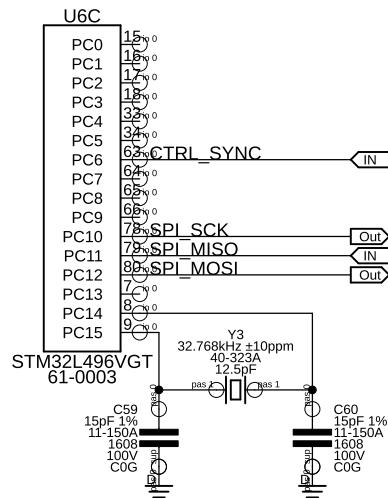
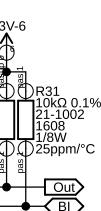
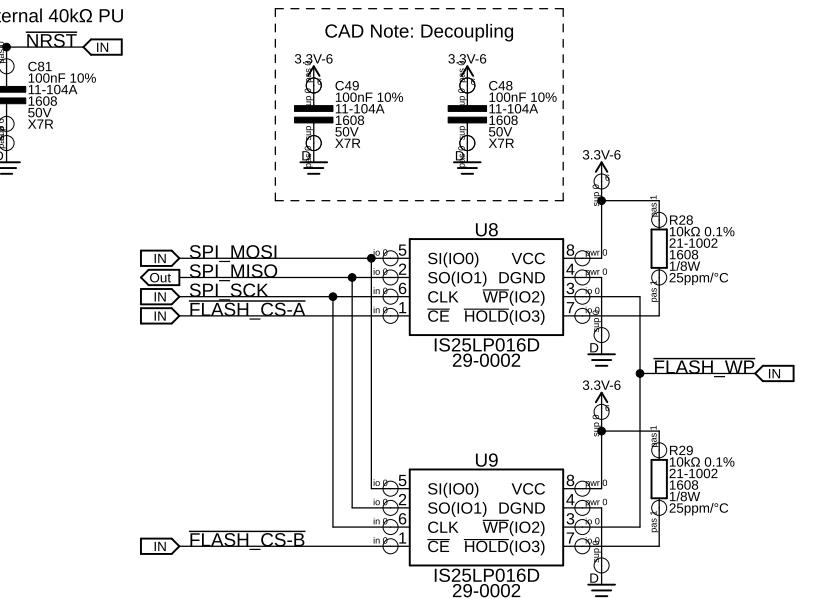
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4

5

6





**A**

```

graph LR
    A[DAC_SLEEP-230] --- B[PC_3.1V-0]
    A --- C[PC_3.1V-1]
    A --- D[PC_3.1V-2]
    A --- E[PC_5.0V-0]
    A --- F[PC_5.0V-1]
    B -- IN --> G[OUT]
    C -- IN --> H[OUT]
    D -- IN --> I[OUT]
    E -- IN --> J[OUT]
    F -- IN --> K[OUT]
  
```

RFCLK\_CS-MOD RFCLK\_CS-230

MUXOUT-DEMOD MUXOUT-MOD MUXOUT-230

FLASH\_WP Out

ADC\_RESET

PA PD-700

DEMOD\_ENABLE Out  
RX\_LNA\_EN Out

1

—

D

A

6

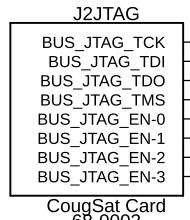
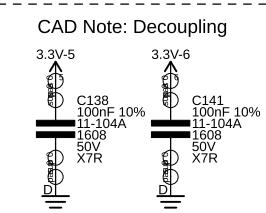
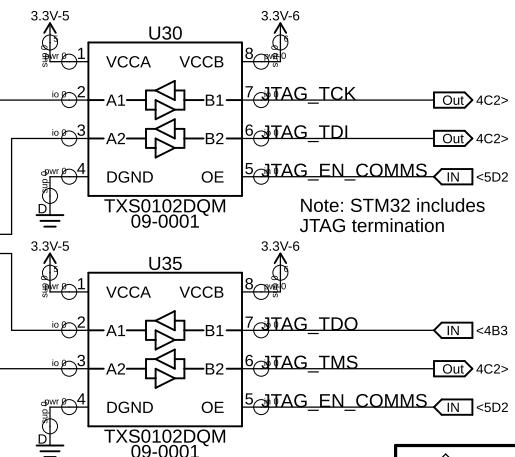
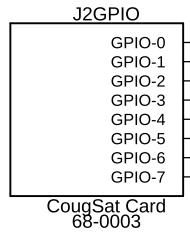
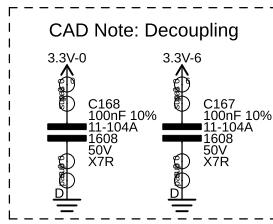
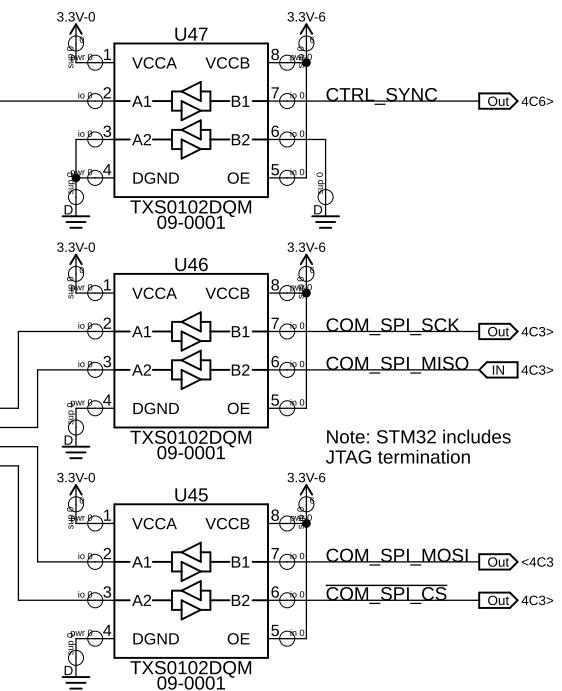
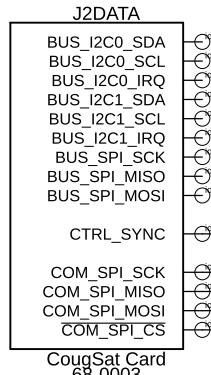
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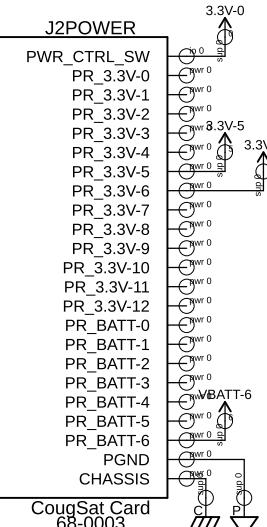
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55

1 | 2 | 3 | 4 | 5 | 6



Title:	Buffers	Size:
Project:	CougSat-1: Comms	SKU:68-0003
Designer:	Bradley L. Davis	Rev: 1.1.0
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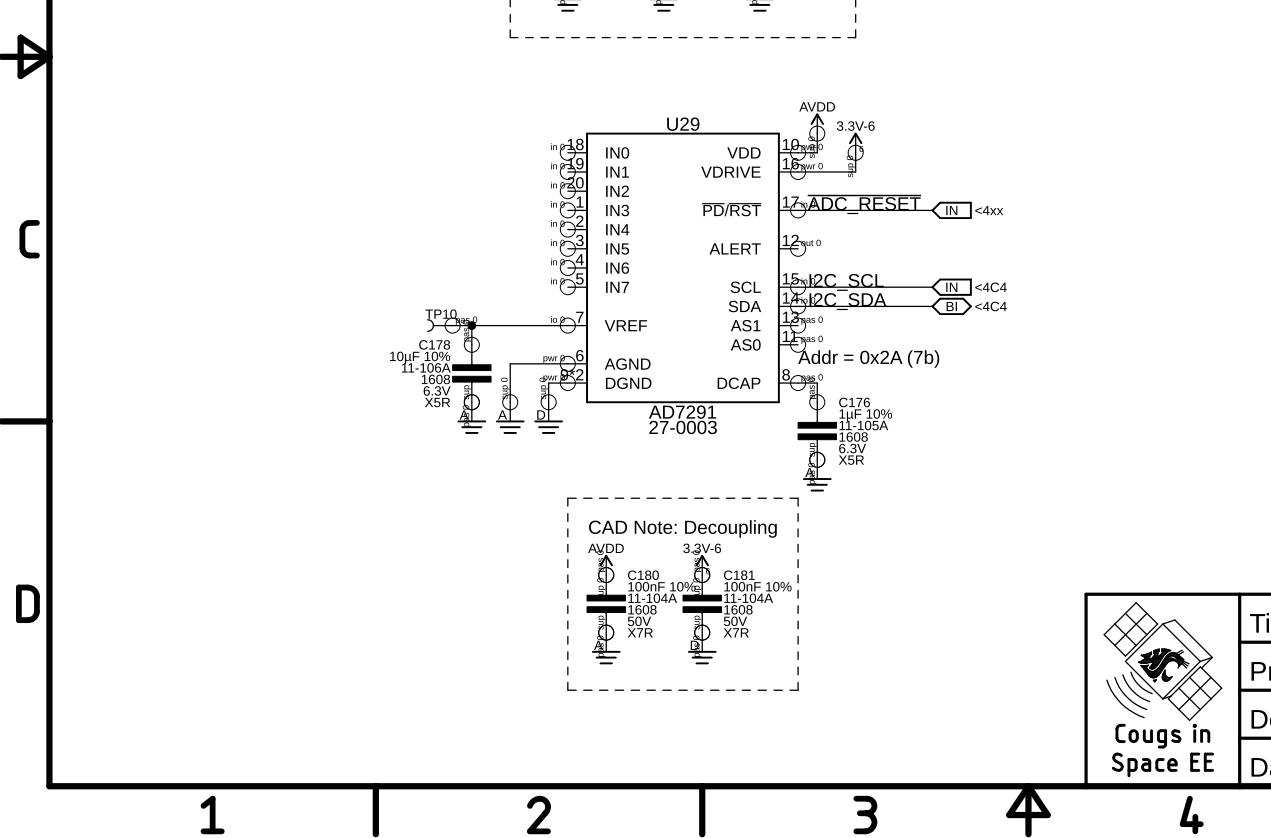
1 | 2 | 3 | 4 | 5 | 6

A

B

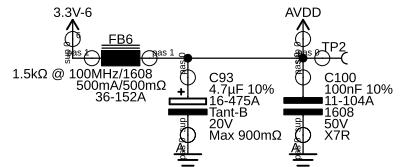
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D



IN -

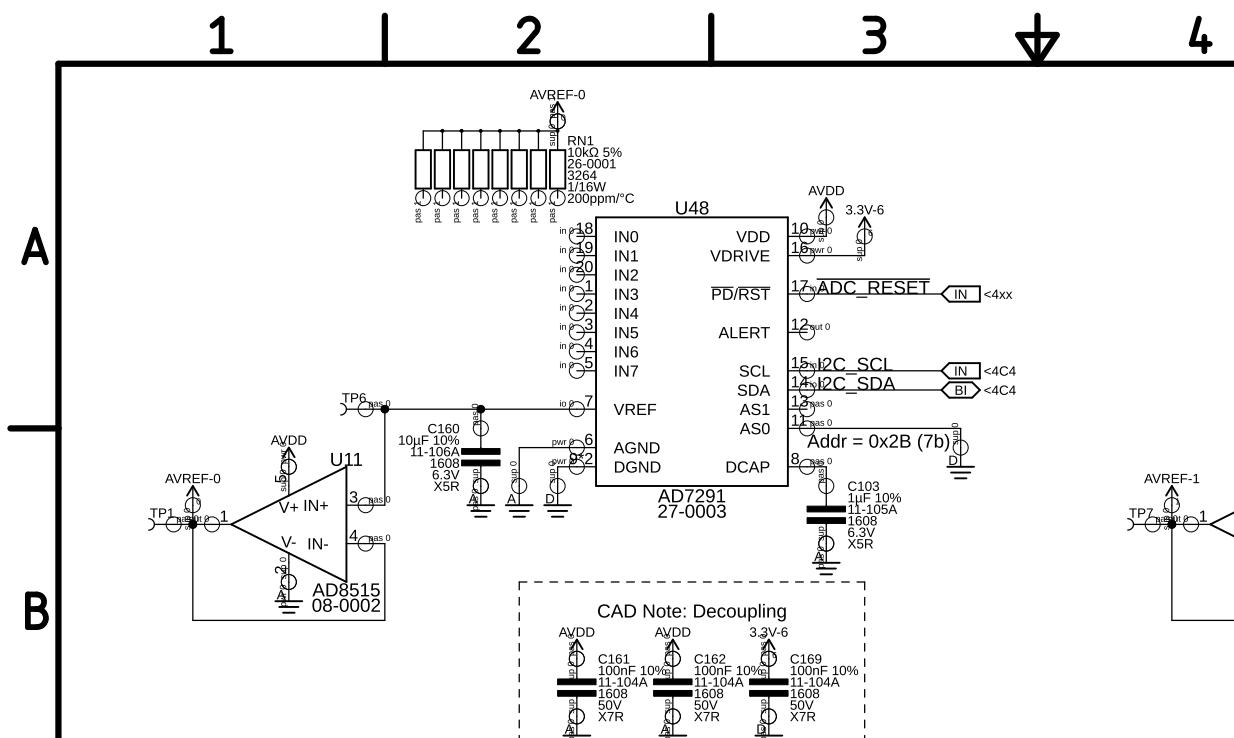
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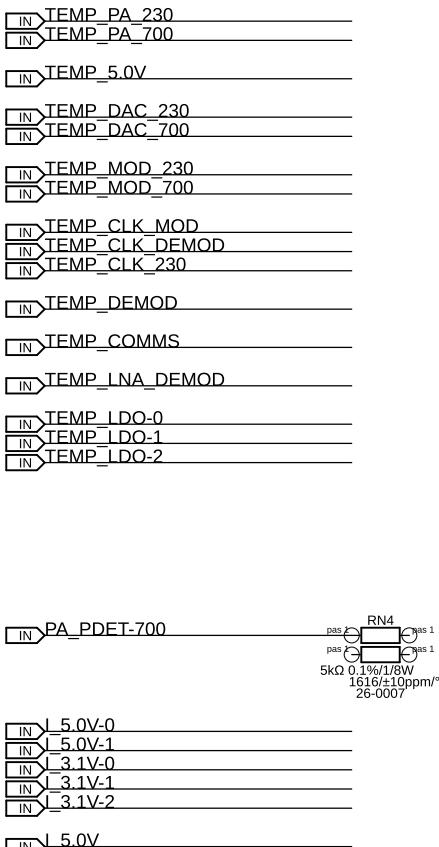
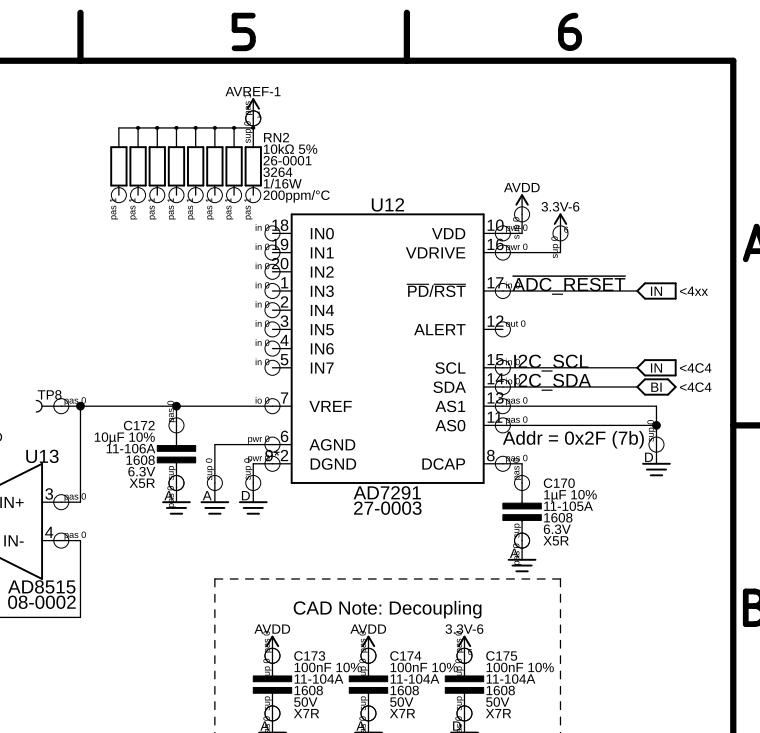


Title:	ADCs	Size:	A
Project:	CougSat-1: Comms	SKU:	68-0003
Designer:	Bradley L. Davis	Rev:	1.1.0
Date:	11/4/2019 11:51 AM	Page:	6/16

5

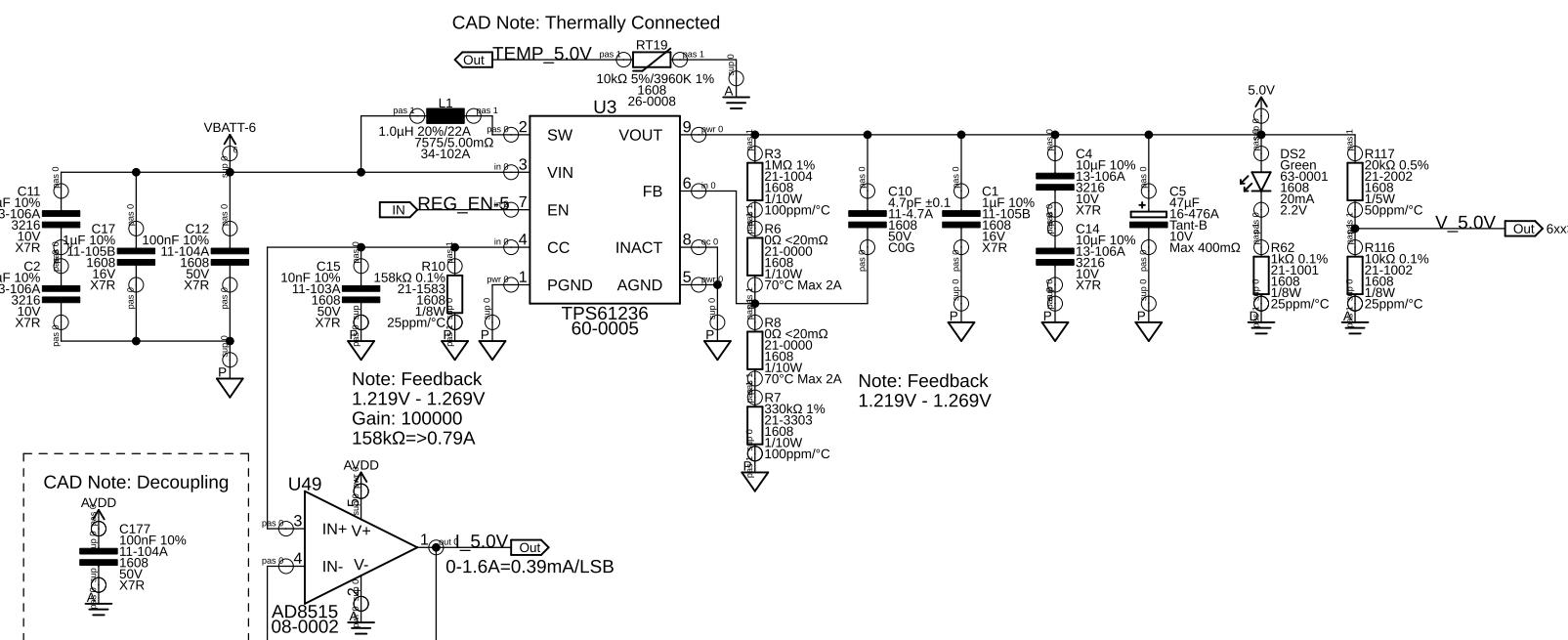
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1 | 2 | 3 | 4 | 5 | 6

A

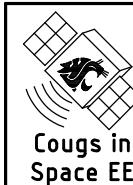
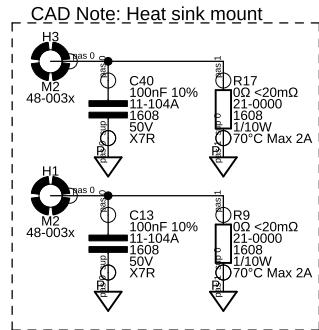


B

↓

C

D

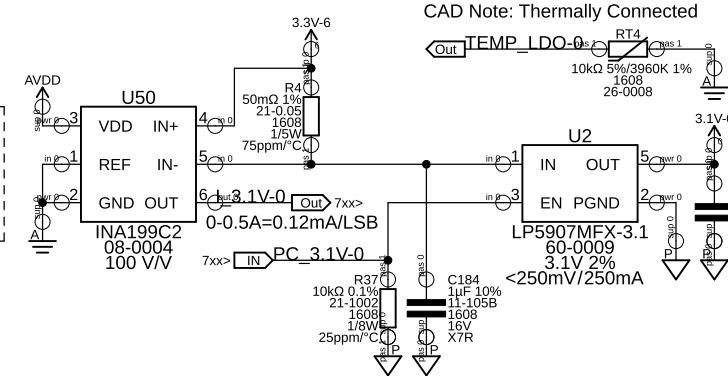


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Project:	CougSat-1: Comms	SKU:68-0003
Designer:	Bradley L. Davis	Rev: 1.1.0
Date:	11/4/2019 11:51 AM	Page: 7/16

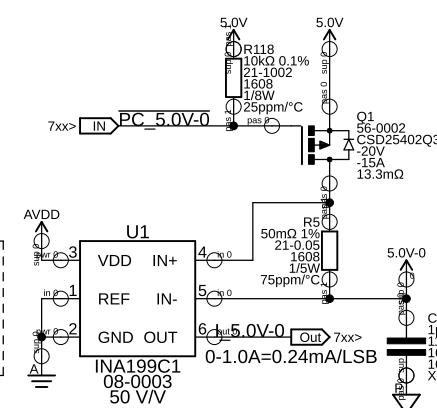
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1 2 3 4 5 6

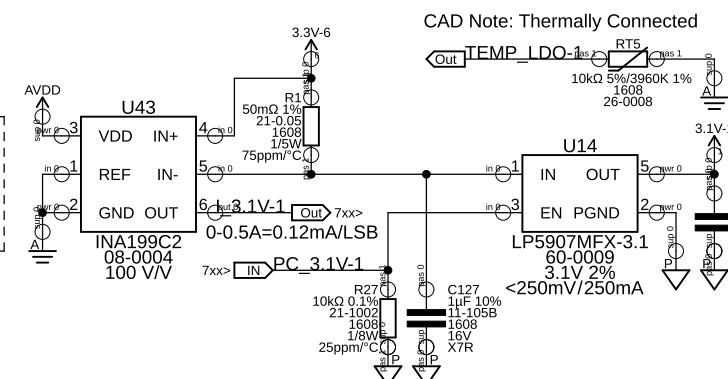
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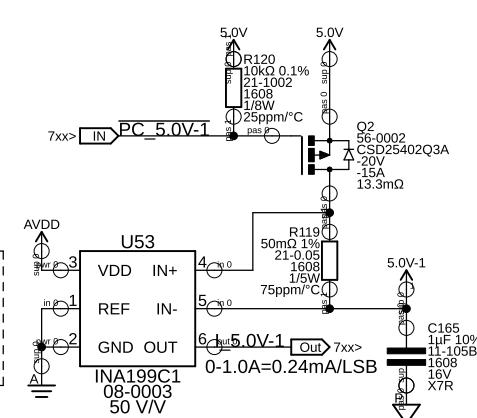
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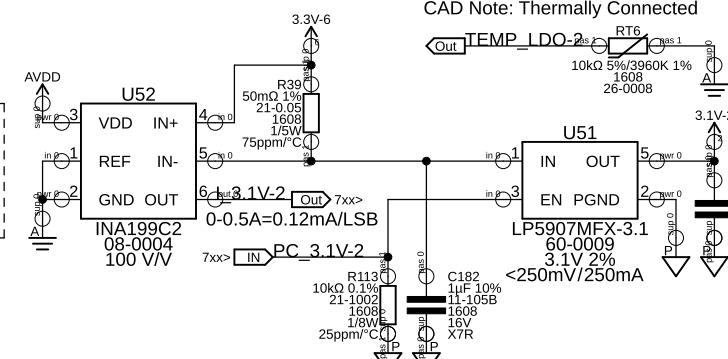
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Decoupling



CAD Note: Thermally Connected



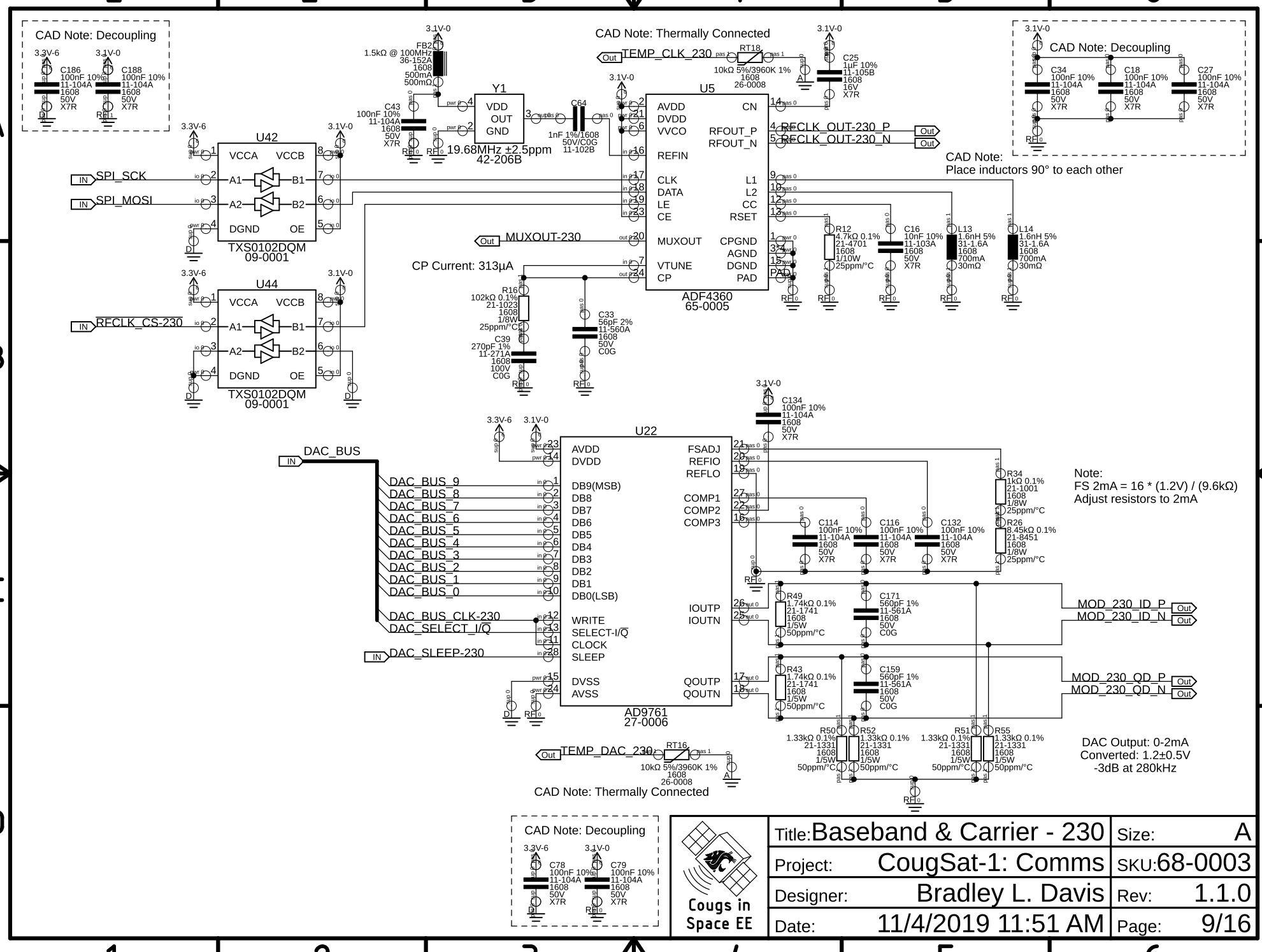
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X7R CAD Note:  
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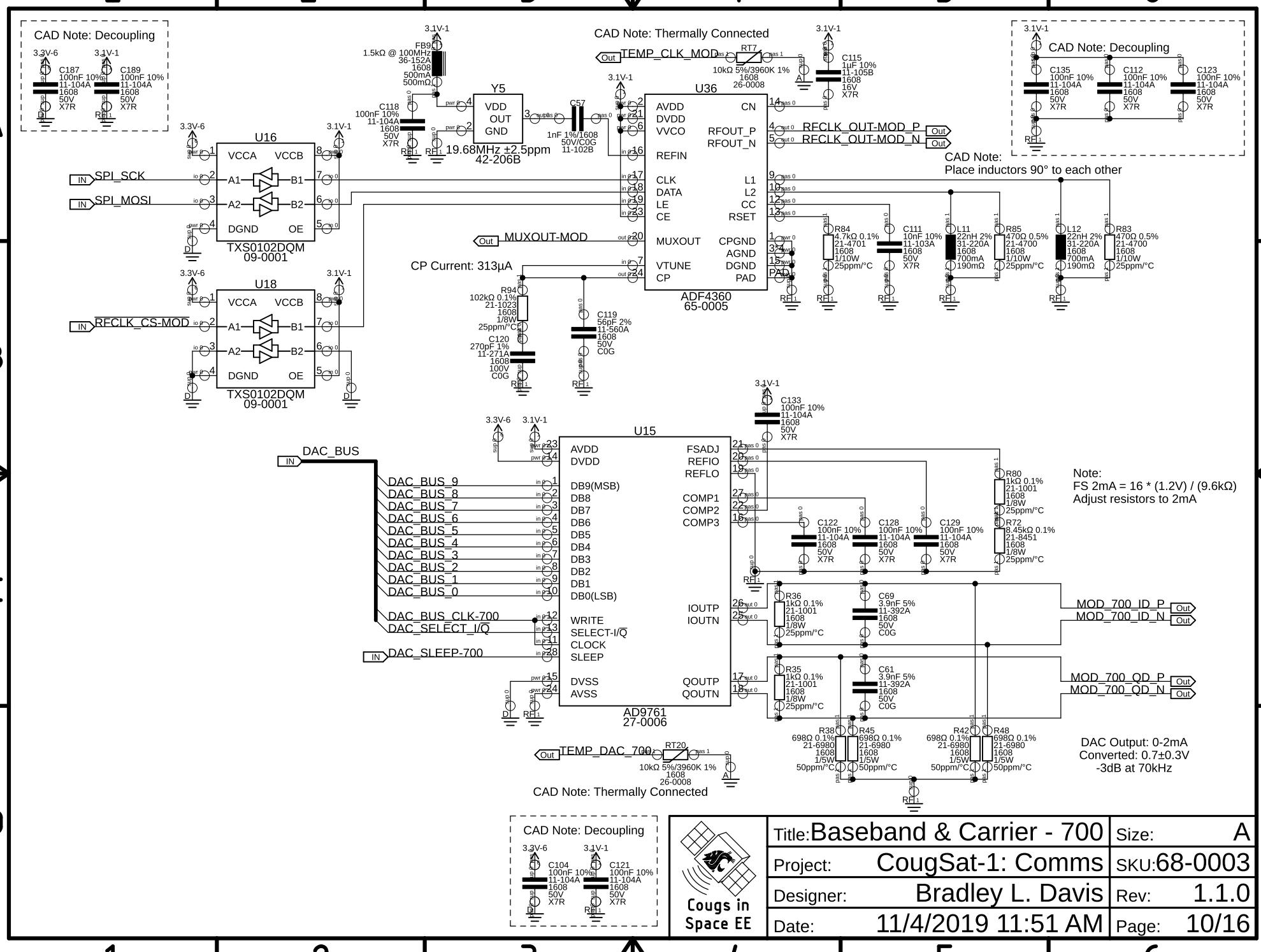


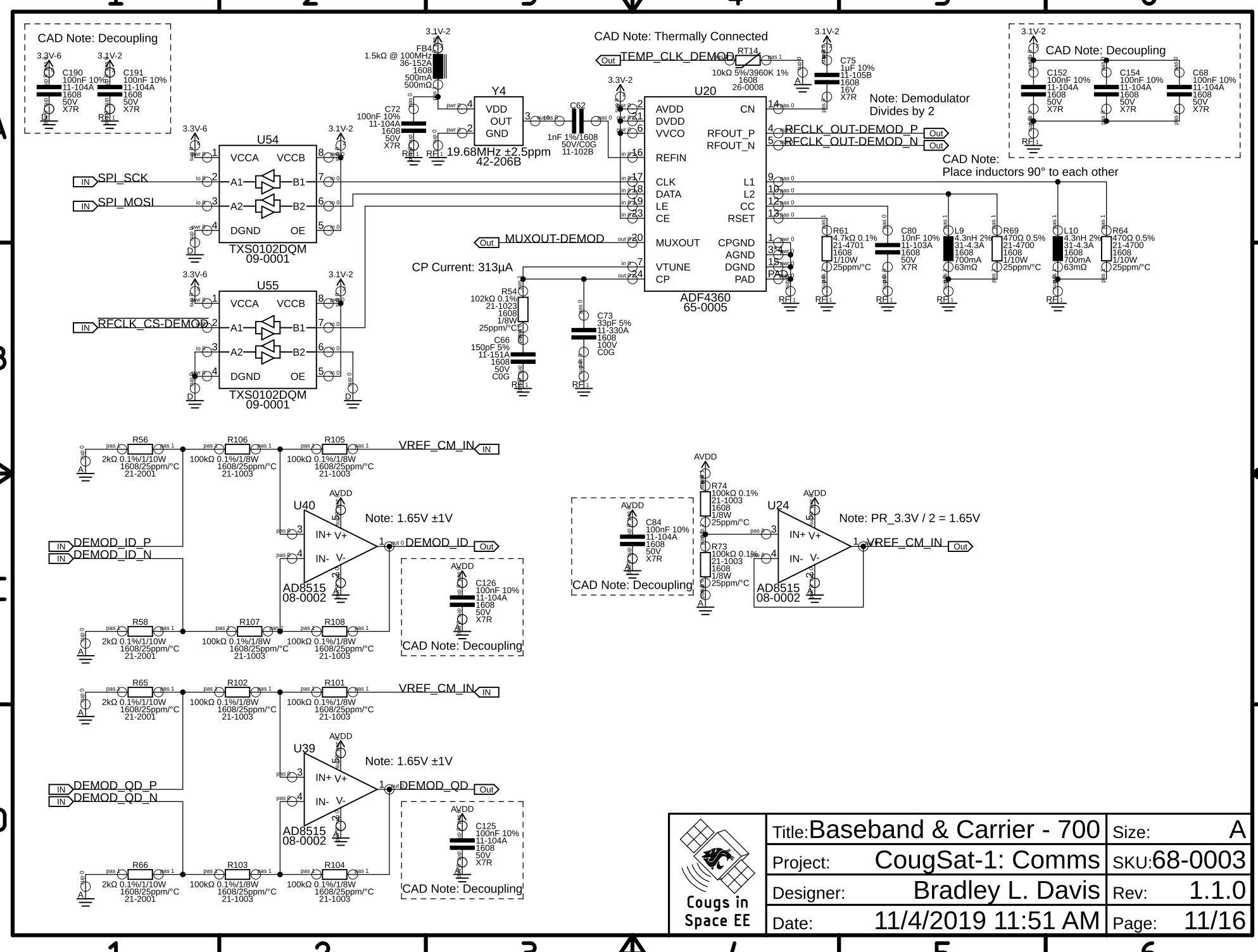
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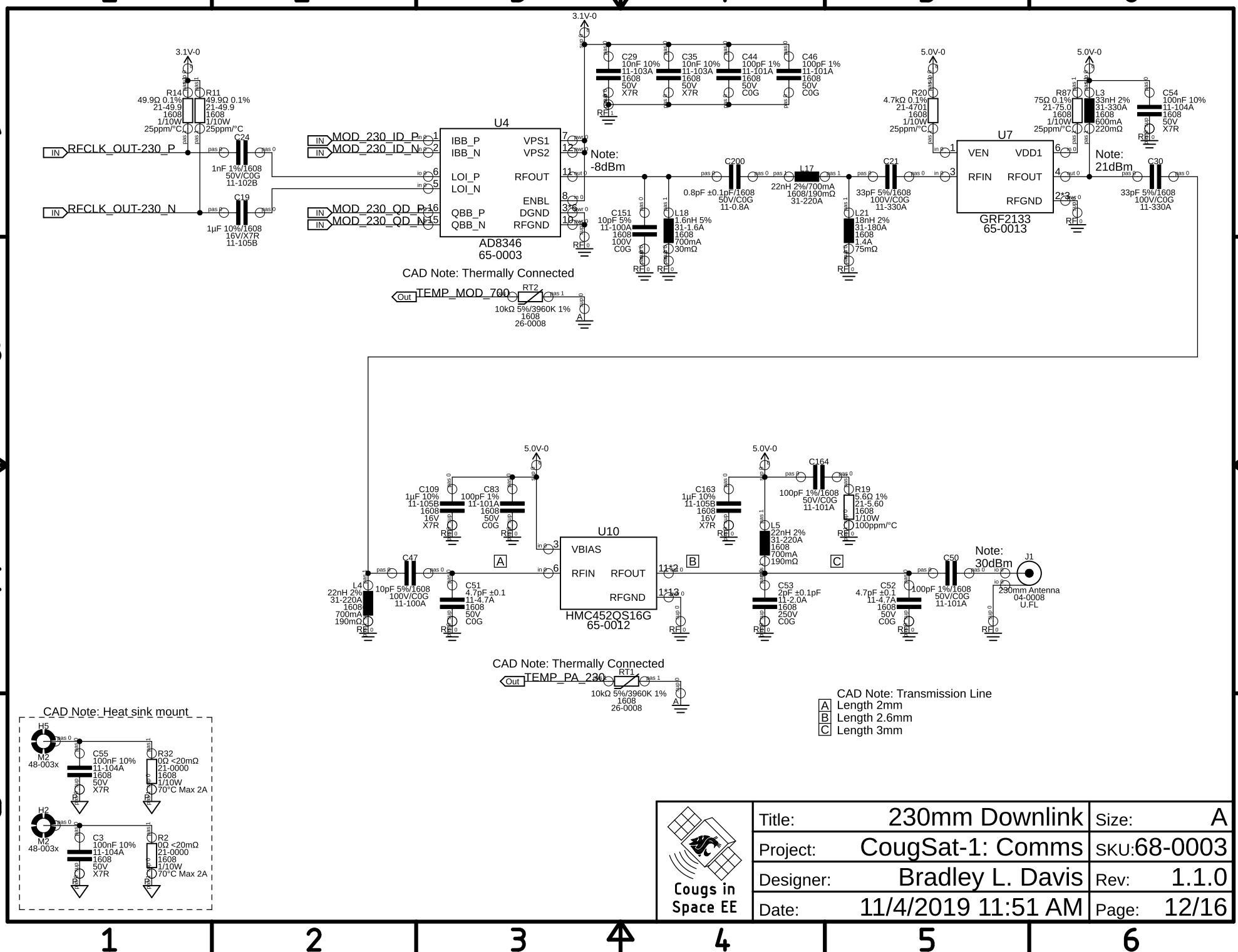
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Project: CougSat-1: Comms	SKU: 68-0003	
Designer: Bradley L. Davis	Rev: 1.1.0	
Date: 11/4/2019 11:51 AM	Page: 8/16	

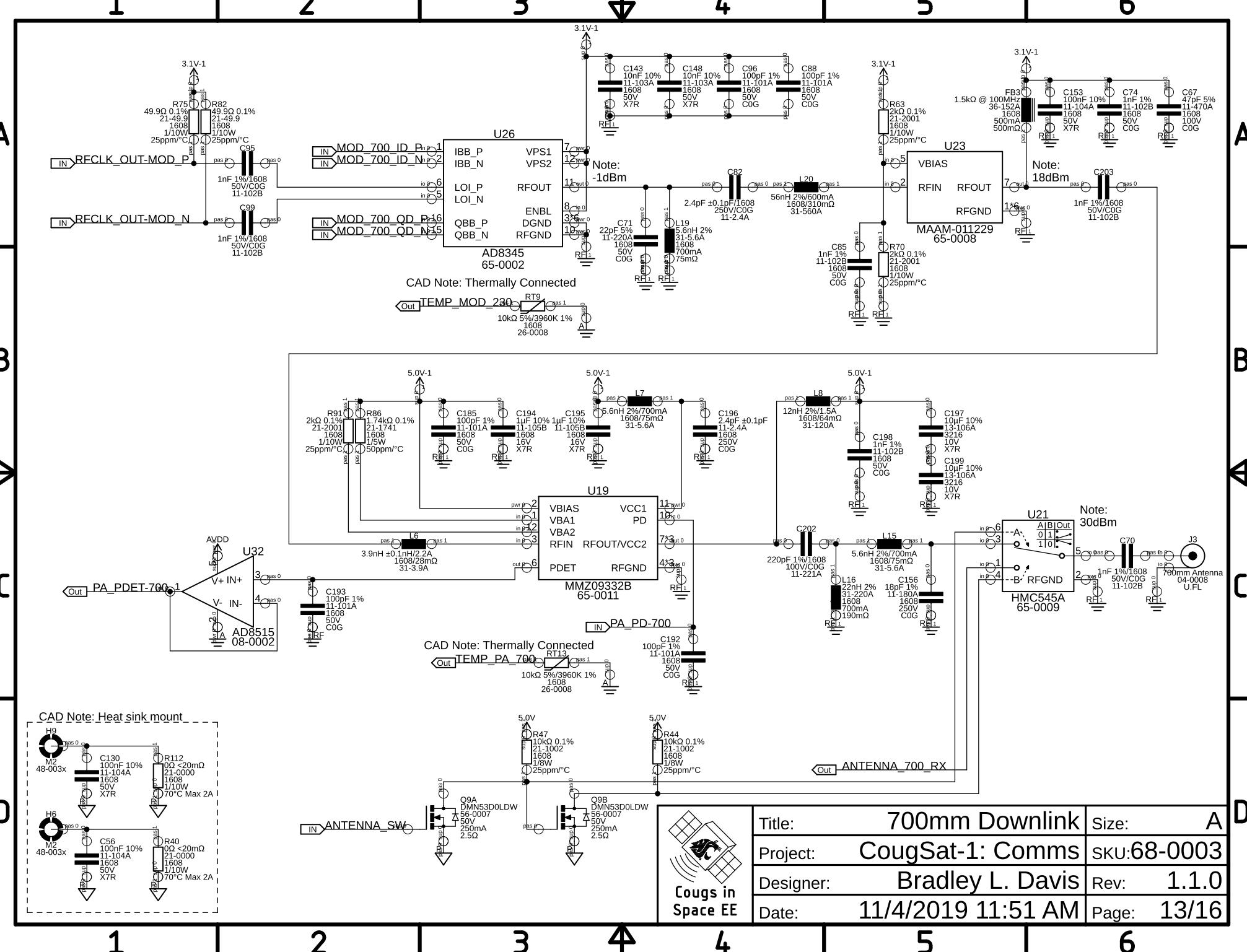
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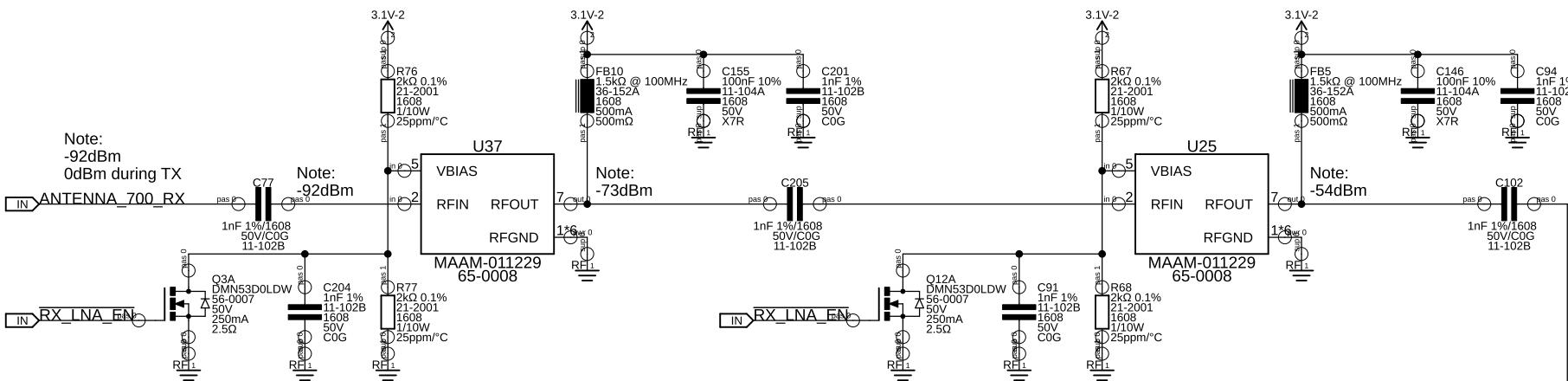






1 | 2 | 3 | 4 | 5 | 6

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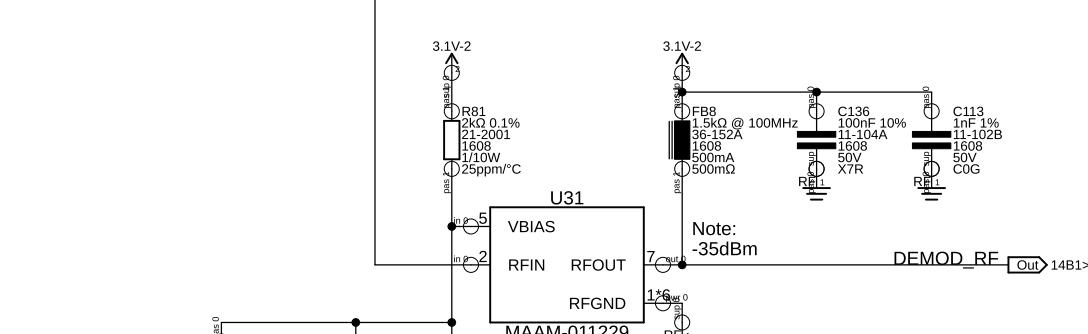
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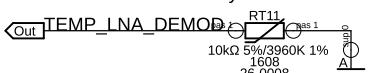
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C

D



CAD Note: Thermally Connected



Title: 700mm Uplink Amplifiers

Size: A

Project: CougSat-1: Comms

SKU: 68-0003

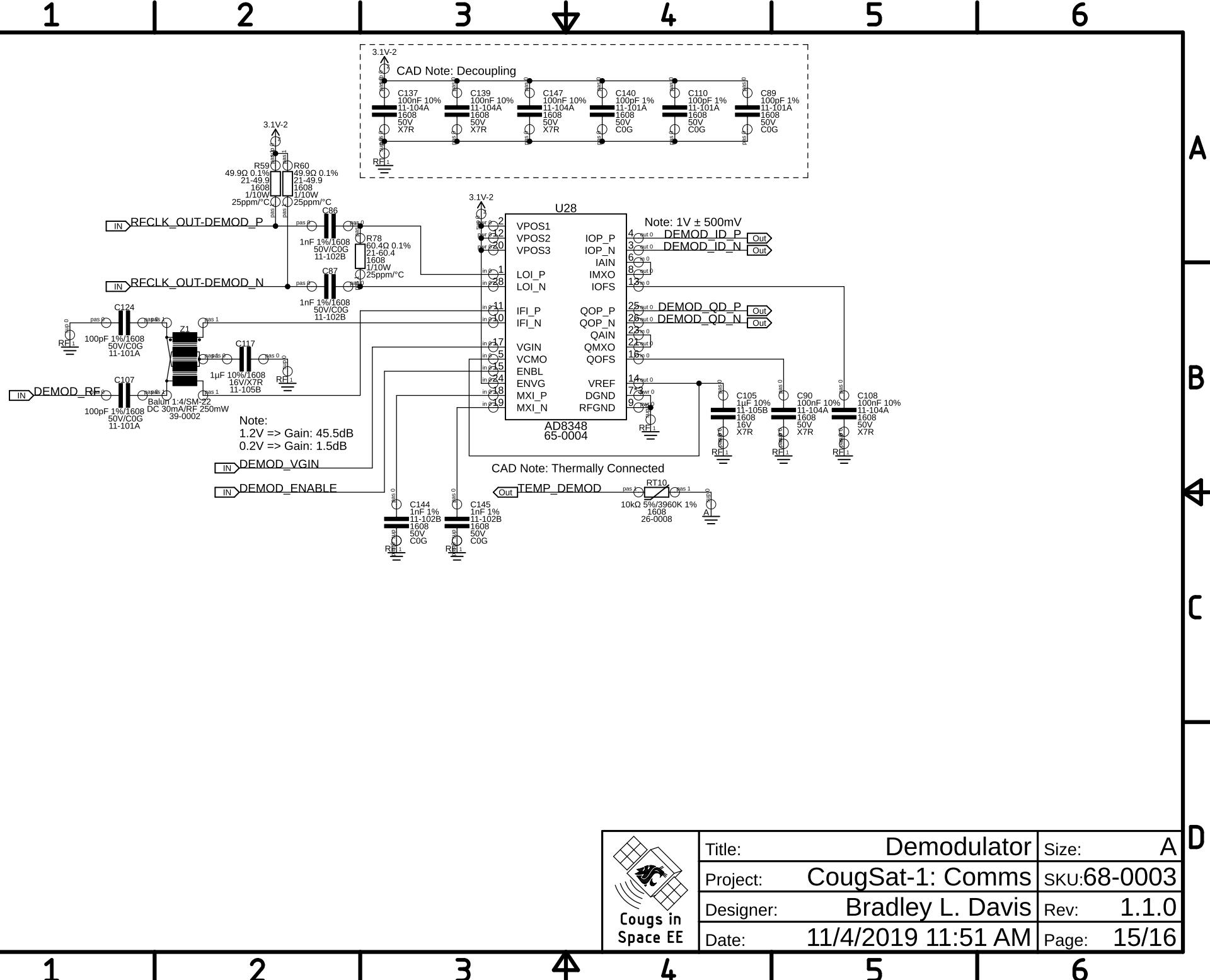
Designer: Bradley L. Davis

Rev: 1.1.0

Date: 11/4/2019 11:51 AM

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1 | 2 | 3 | 4 | 5 | 6



# Title: Demodulator

## Project: CougSat-1: Comms

Designer: Bradley L. Davis

Date: 11/4/2019 11:51 AM

Size: A

SKU:68-0003

Rev: 1.1.0

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1 2 3 4 5 6

A

A

B

B

→

←

C

C

D

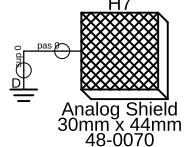
D

J2MECH-TOP

J2MECH-BOTTOM

CougSat Card  
68-0003

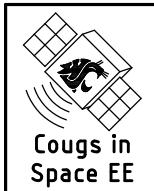
CougSat Card  
68-0003



LOGO3  
Speed Limit

LOGO1  
Signature  
LOGO2  
Satellite 16mm

Cougs in  
Space



Title:	Mechanical	Size:	A
Project:	CougSat-1: Comms	SKU:	68-0003
Designer:	Bradley L. Davis	Rev:	1.1.0
Date:	11/4/2019 11:51 AM	Page:	16/16

1 2 3 4 5 6