

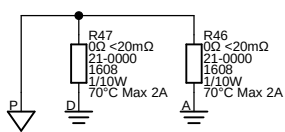
Umbilical
Charging

Solar
Panels

PV_IN-0
PV_IN-1
PV_IN-2
PV_IN-3
PV_IN-4
PV_IN-5
PV_IN-6
PV_IN-7

Note: Each cell is 1W
MPPT ICs output (PV_IN):
CV 4.1V
CC 300mA

Note: Umbilical charger output (UMB_IN):
CV 4.1V
CC 1A



Switching

Switching

Battery
A

Battery
B

Note: Each battery
can output 4A
continuously

Note: Each SMPS
can output 3A
continuously

3.3V
SMPS
A

3.3V
SMPS
B

Power
ORing

EPS

Switching

- PR 3.3V-0: 20mA → IHU
- PR 3.3V-1: 60mA → IHU: SD Card
- PR 3.3V-2: 20mA → ADCS
- PR 3.3V-3: 45mA → ADCS: IMUs
- PR 3.3V-4: 55mA → ADCS: GPS
- PR 3.3V-5: 90mA → IFJR & SD Card
- PR 3.3V-6: 105mA → Comms & Radios
- PR BATT-5: 300mA → ADCS: Magnetorquers
- PR BATT-6: 400mA → Comms: TX Amplifier
- PR 3.3V-7: 50mA → Payload: 0
- PR 3.3V-8: 390mA → Payload: 1
- PR 3.3V-9: 25mA → Payload: 2
- PR 3.3V-10: 15mA → Payload: 4
- PR 3.3V-11: 390mA → Payload: 5
- PR 3.3V-12: 0mA → Payload: 6
- PR BATT-0: 250mA → Payload: 7
- PR BATT-1: 0mA → Payload: 8
- PR BATT-2: 0mA → Payload: 9
- PR BATT-3: 0mA → Payload: 10
- PR BATT-4: 0mA → Payload: 11

Note: Each power rail channel (PR_) is rated for 1A
PR_DEPLOY is rated for 2A
Currents shown are the expected consumption

Satellite Bus

CougSat-1 Payload
Germination Lighting

Germination Camera

Germination Sensors

Ionizing Radiation Sensor

Ground Camera

Unused

Germination Heater

Unused

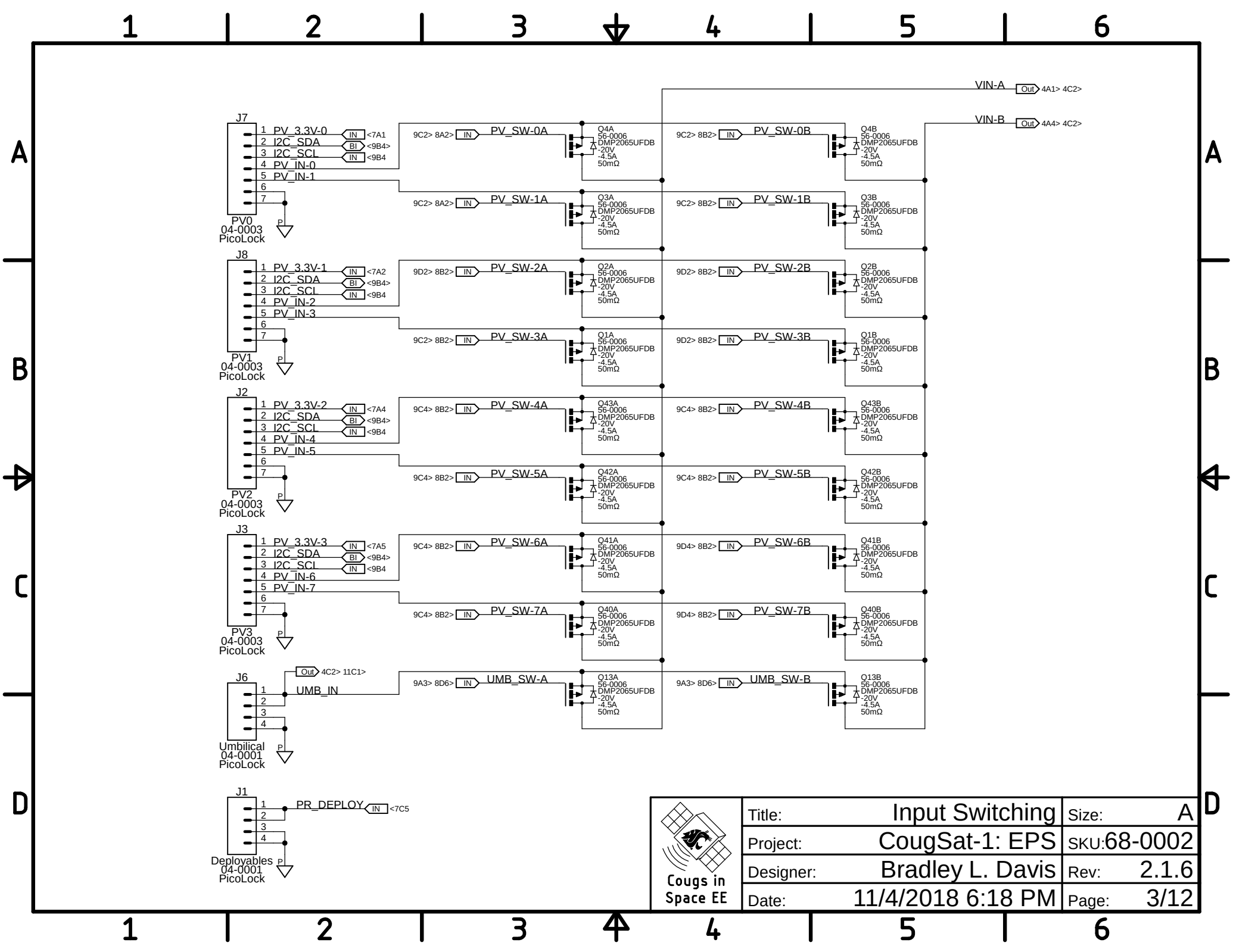
Unused

Unused

Unused

Title:	Power Rails	Size:	A
Project:	CougSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
Date:	11/4/2018 6:18 PM	Page:	2/12





Title:	Input Switching	Size:	A
Project:	CougSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
Date:	11/4/2018 6:18 PM	Page:	3/12

1

2

3

4

5

6

A

B

C

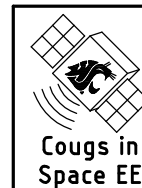
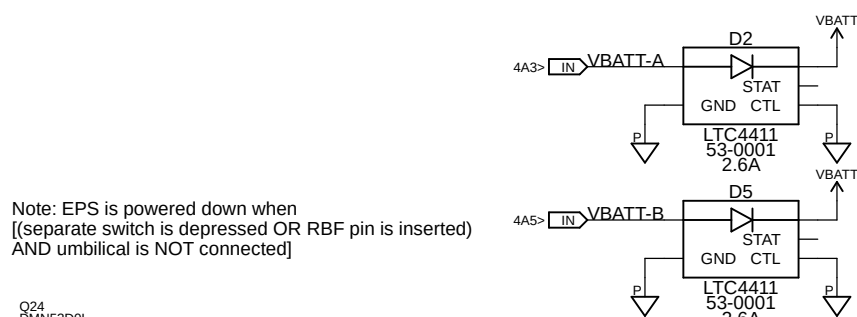
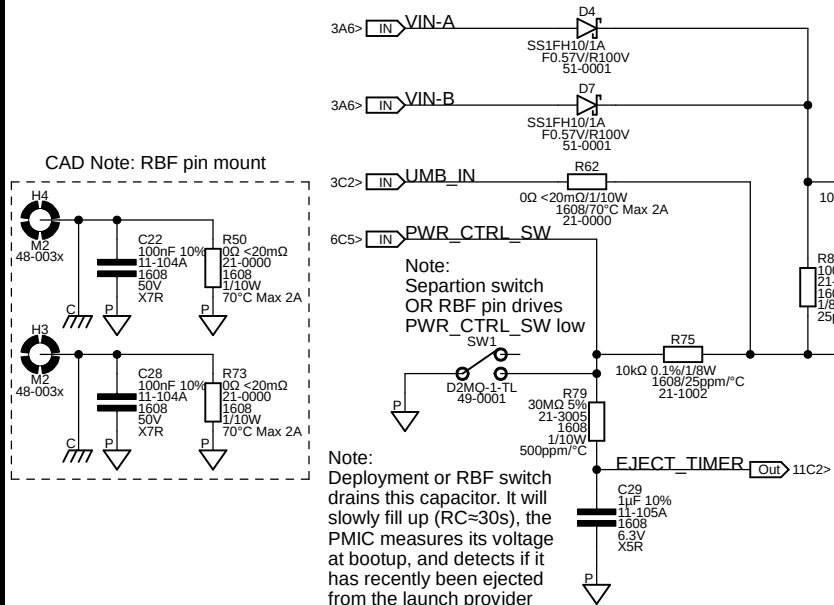
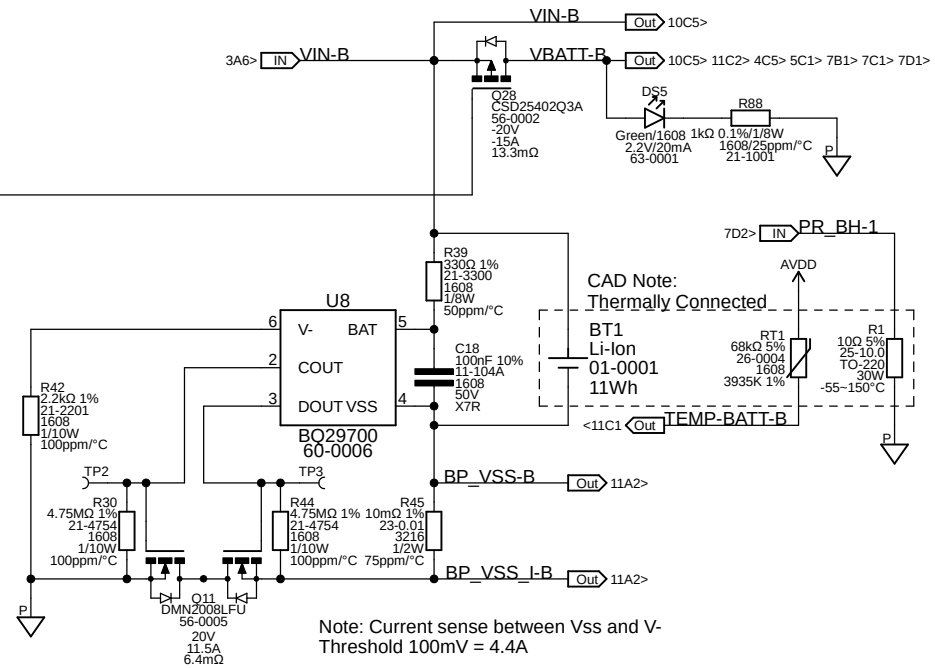
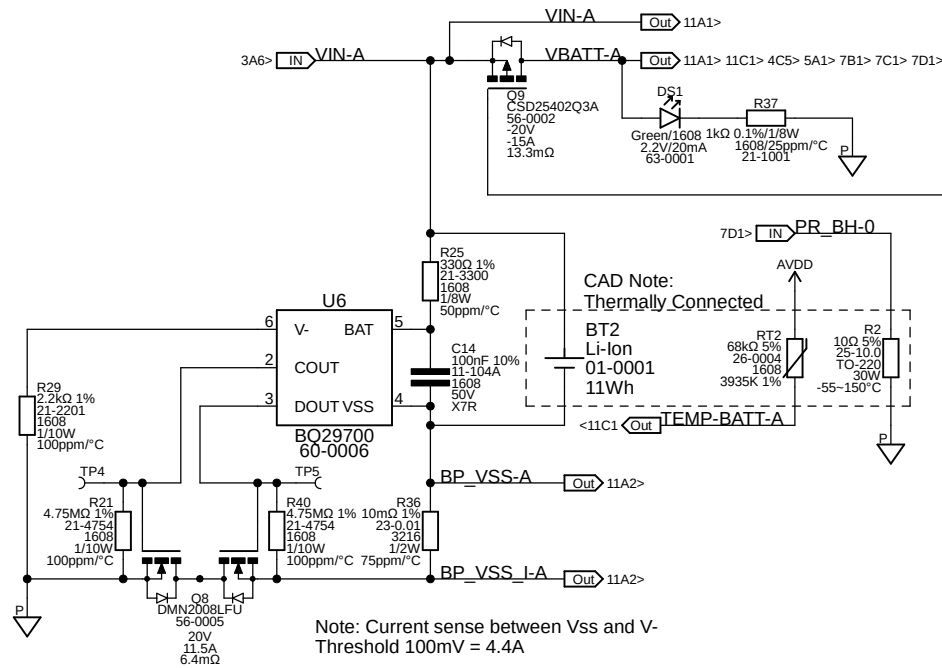
D

A

B

C

D



Title:	Batteries	Size:	A
Project:	CougsSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
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A

A

B

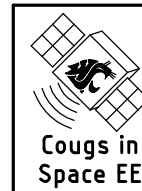
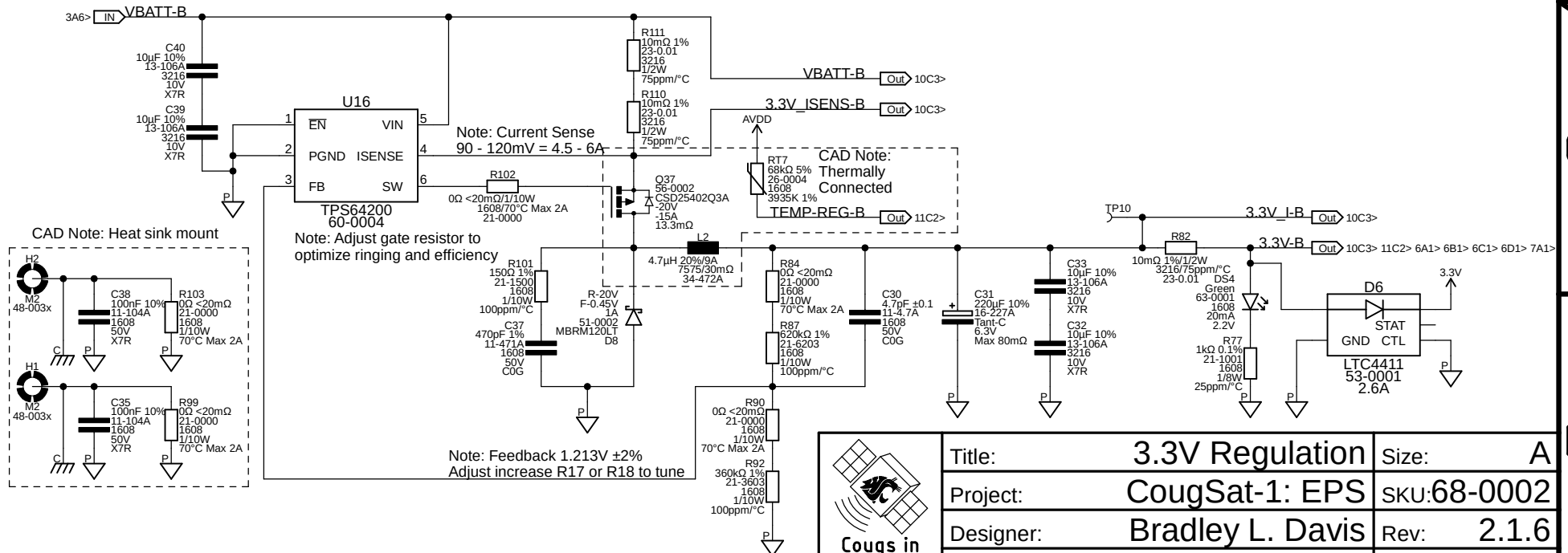
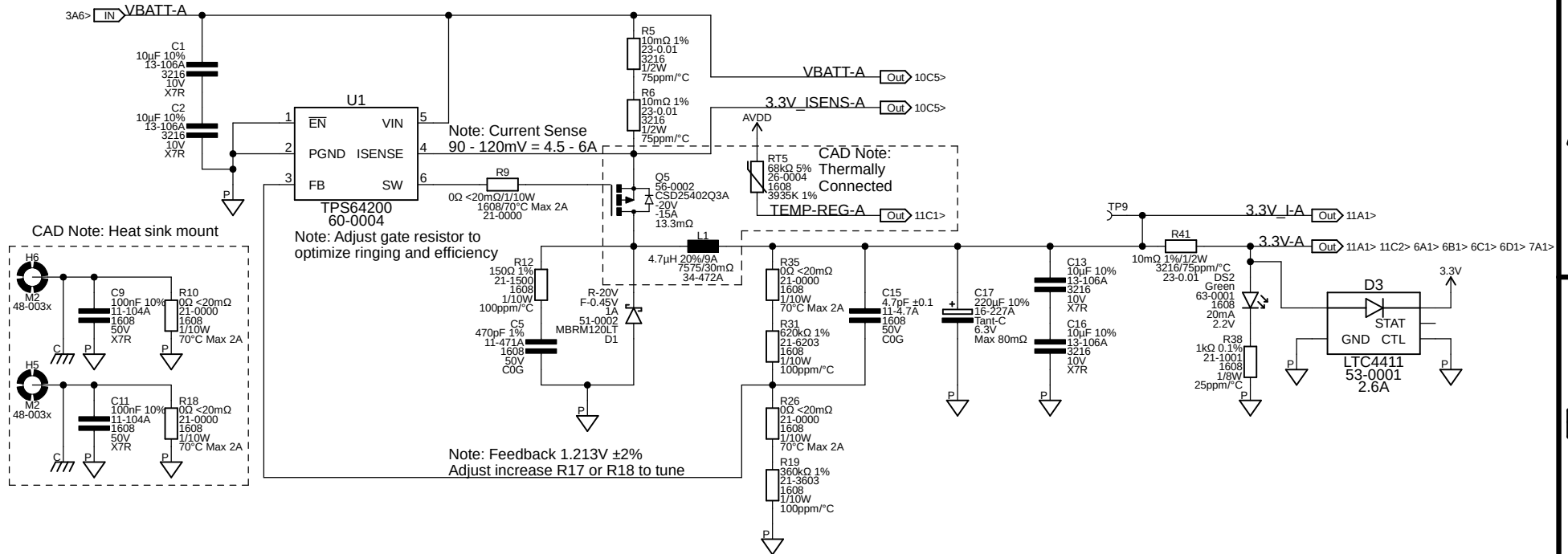
B

C

C

D

D



Title:	3.3V Regulation	Size:	A
Project:	CougSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
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A

B

C

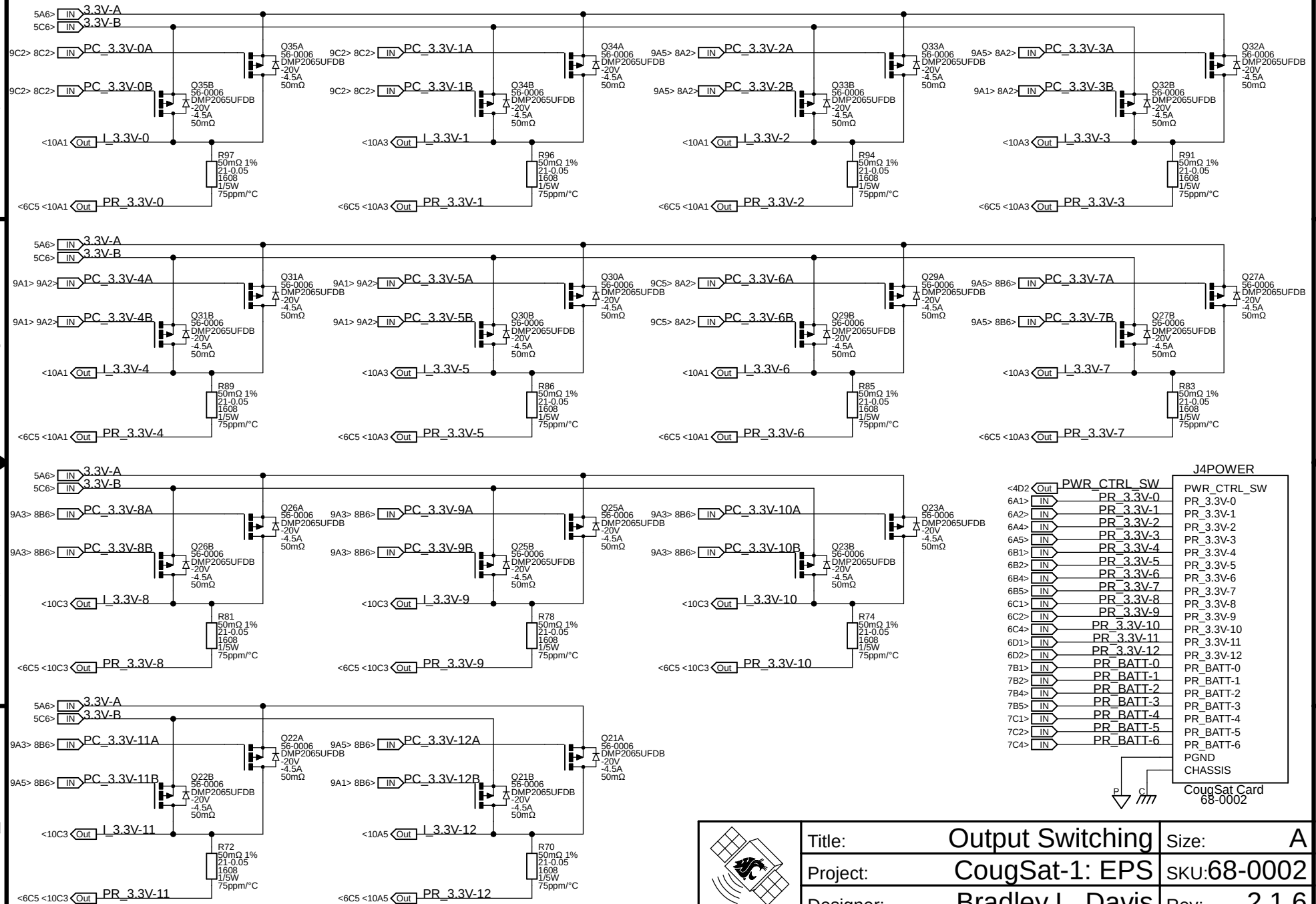
D

A

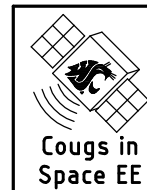
B

C

D



J4POWER	
<4D2 Out PWR_CTRL_SW	PWR_CTRL_SW
6A1> IN	PR_3.3V-0
6A2> IN	PR_3.3V-1
6A4> IN	PR_3.3V-2
6A5> IN	PR_3.3V-3
6B1> IN	PR_3.3V-4
6B2> IN	PR_3.3V-5
6B4> IN	PR_3.3V-6
6B5> IN	PR_3.3V-7
6C1> IN	PR_3.3V-8
6C2> IN	PR_3.3V-9
6C4> IN	PR_3.3V-10
6D1> IN	PR_3.3V-11
6D2> IN	PR_3.3V-12
7B1> IN	PR_BATT-0
7B2> IN	PR_BATT-1
7B4> IN	PR_BATT-2
7B5> IN	PR_BATT-3
7C1> IN	PR_BATT-4
7C2> IN	PR_BATT-5
7C4> IN	PR_BATT-6
	PGND
	CHASSIS
	CougSat Card 68-0002



Title:	Output Switching	Size:	A
Project:	CougSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
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A

A

B

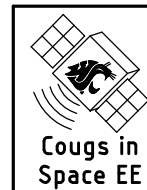
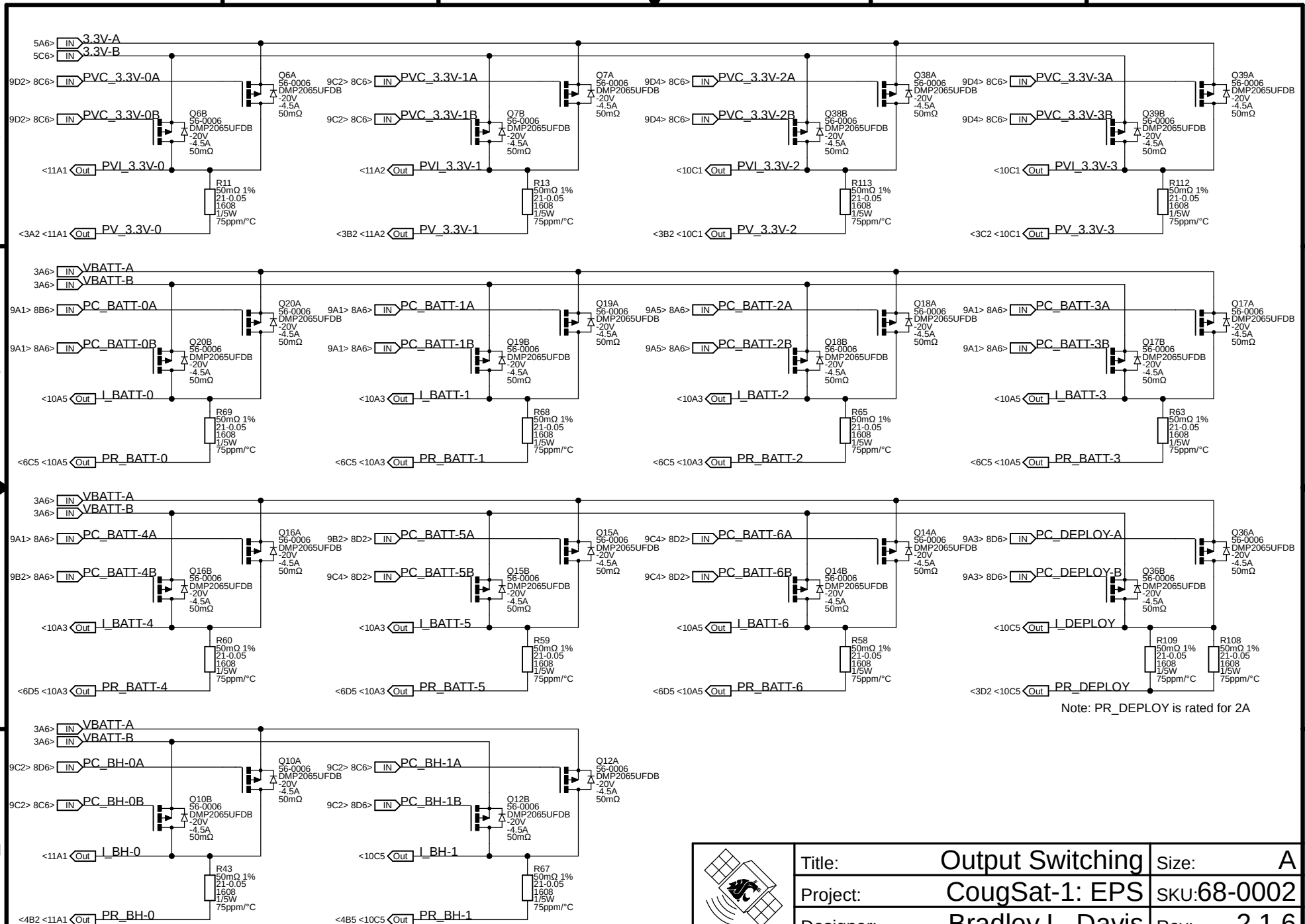
B

C

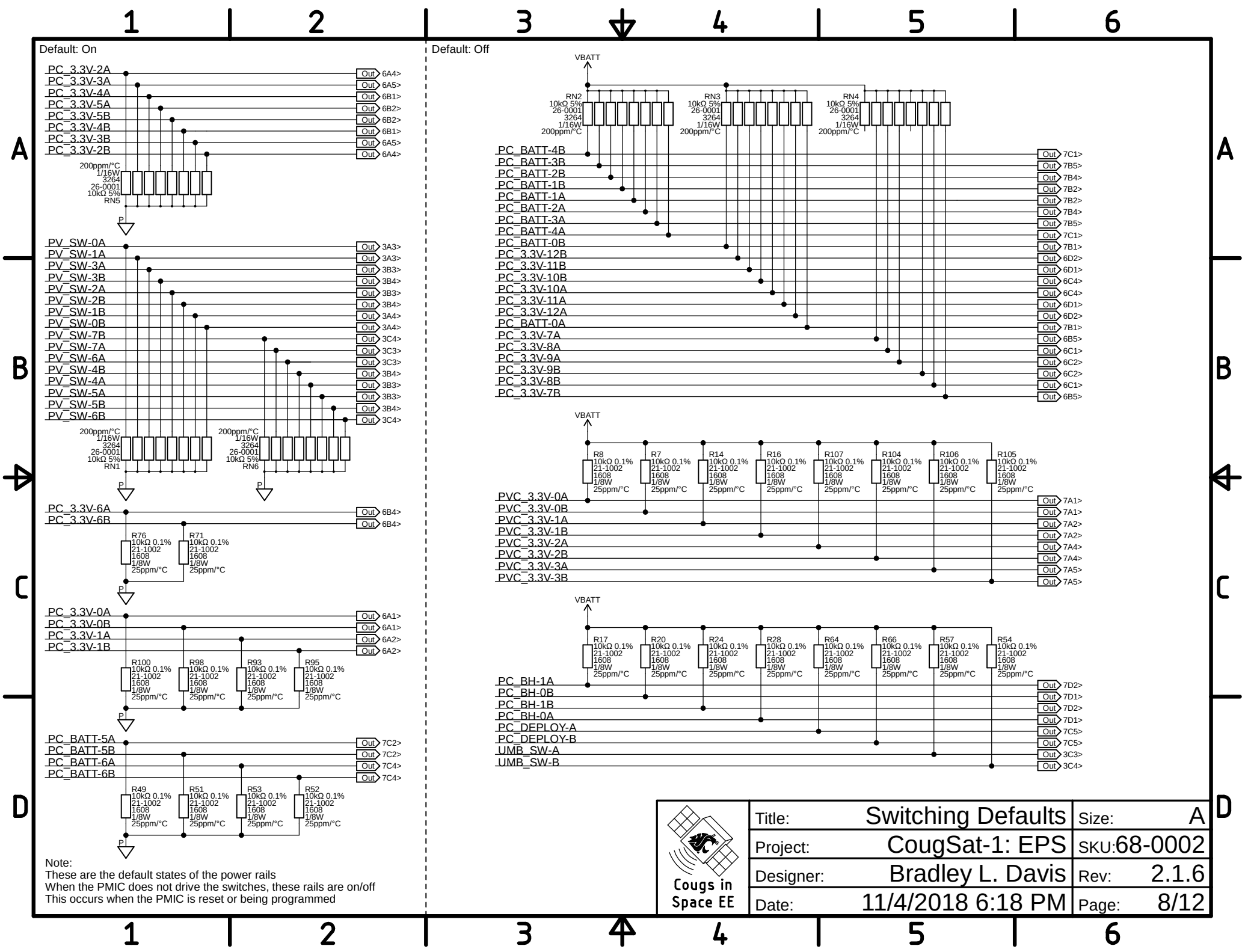
C


D

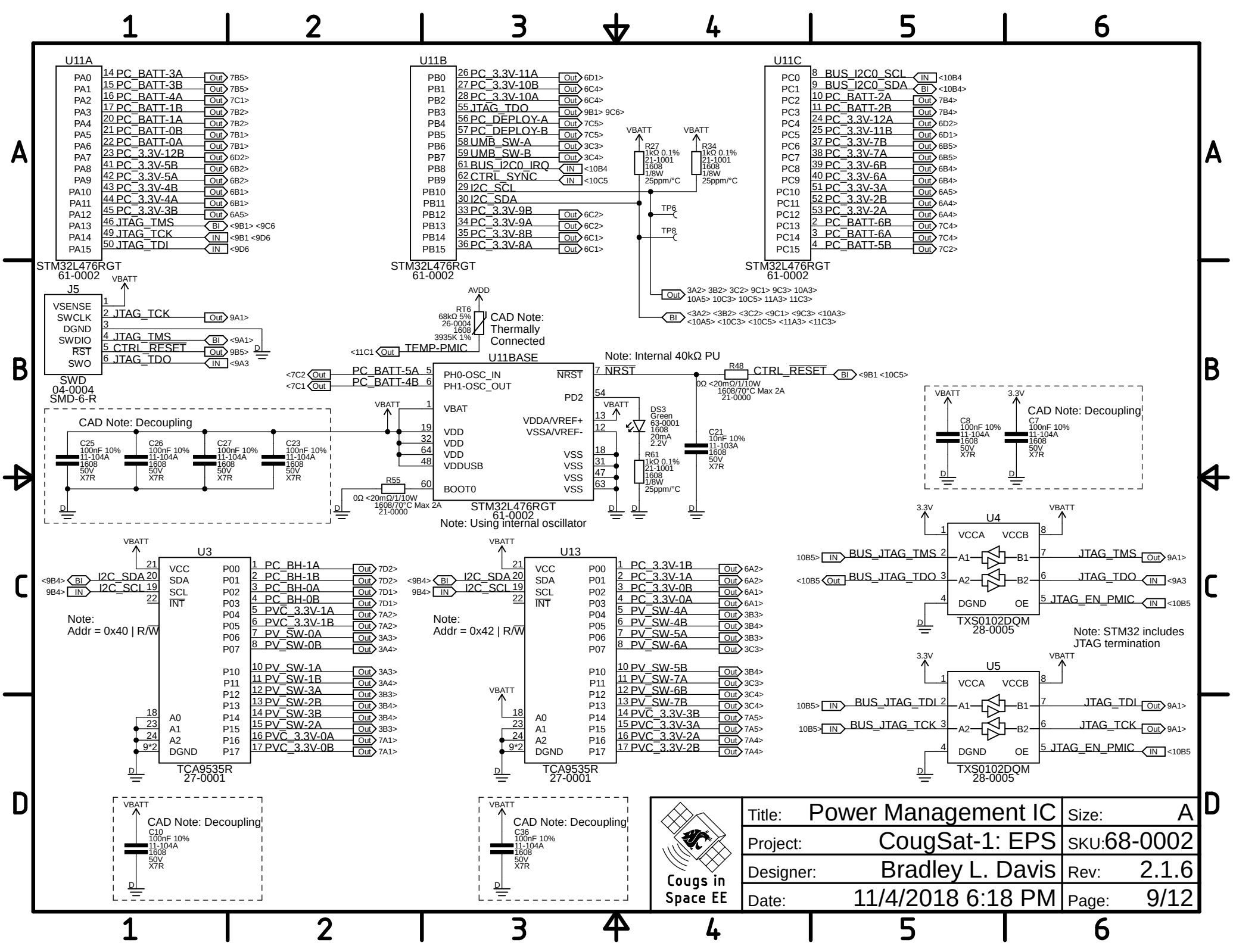
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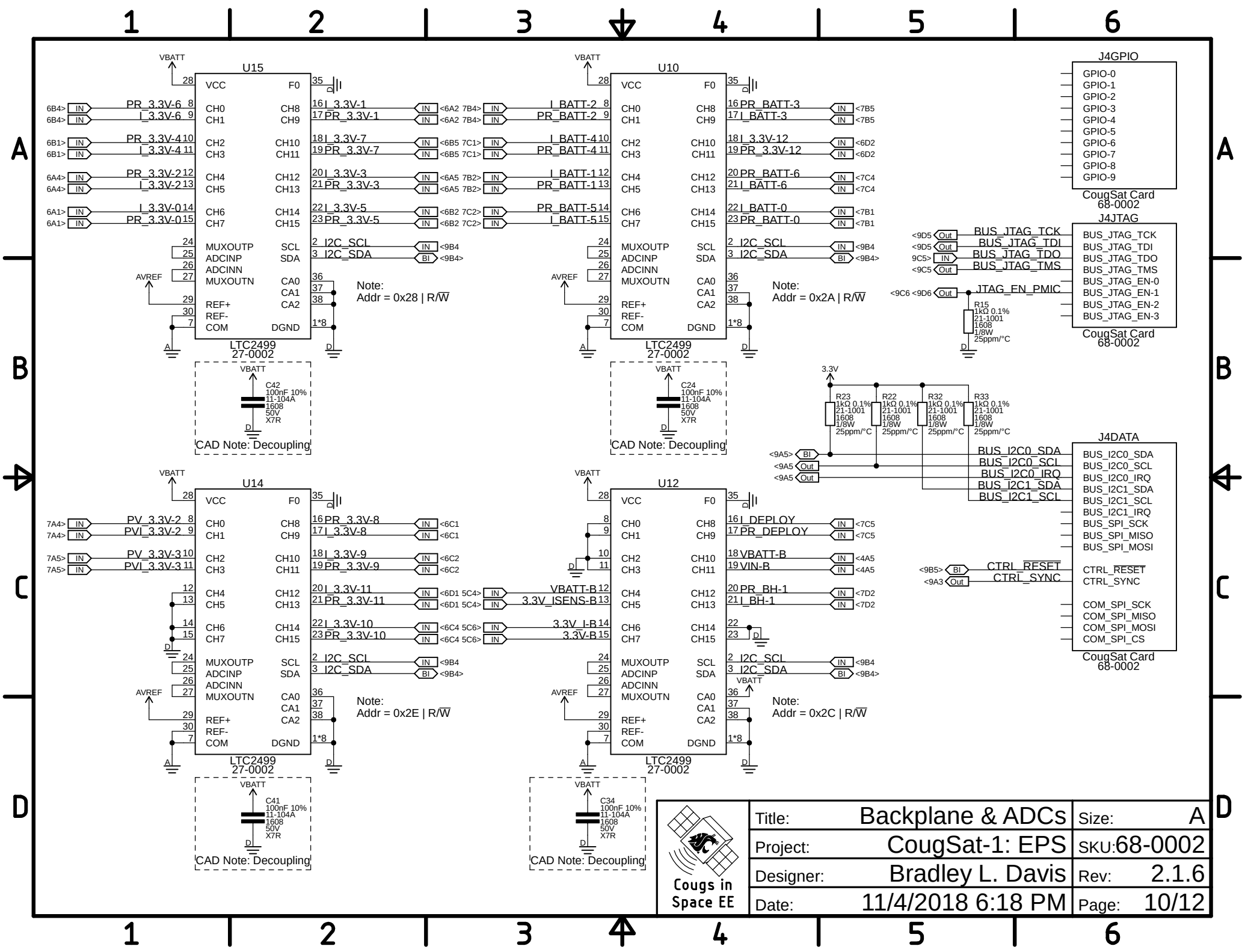
Title:	Output Switching	Size:	A
Project:	CougsSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
Date:	11/4/2018 6:18 PM	Page:	7/12




 Cougs in Space EE	Title: Switching Defaults	Size: A
	Project: CougSat-1: EPS	SKU:68-0002
	Designer: Bradley L. Davis	Rev: 2.1.6
	Date: 11/4/2018 6:18 PM	Page: 8/12



Title:	Power Management IC	Size:	A
Project:	CougSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
Date:	11/4/2018 6:18 PM	Page:	9/12



 Cougs in Space EE	Title:	Backplane & ADCs	Size:	A
	Project:	CougsSat-1: EPS	SKU:	68-0002
	Designer:	Bradley L. Davis	Rev:	2.1.6
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A

A

B

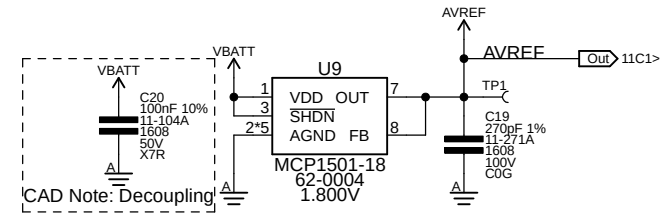
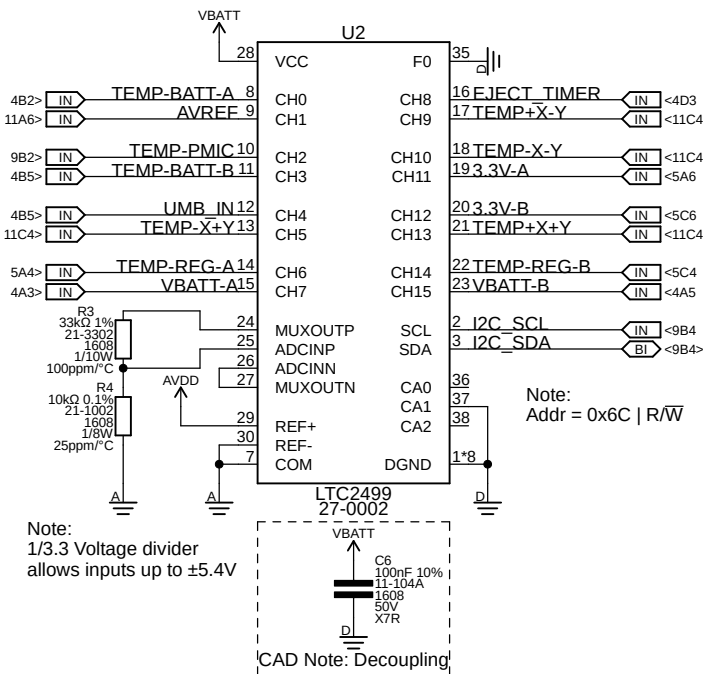
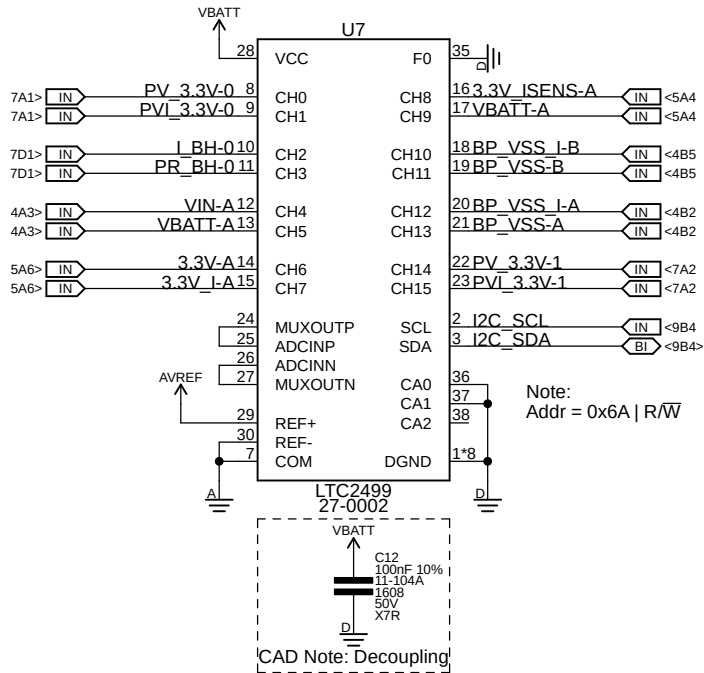
B

C

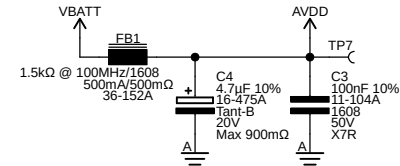
C

D

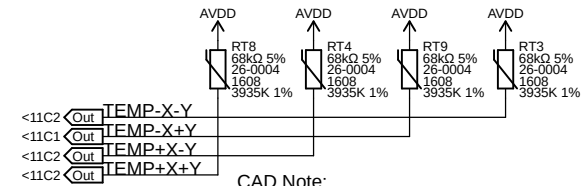
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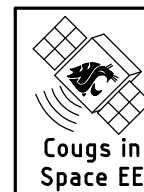
Note:
Differential ADC voltage reference is 1.800V
At 16b, 13.73μV/LSB
Maximum input is ±900mV



Note:
Single-Ended ADC voltage reference is 3.3V
At 16b, 25.18μV/LSB
Maximum input is ±1.65V



CAD Note:
Place in the corner of the PCB
that matches the connected
signal name, bottom side



Title:	ADCs	Size:	A
Project:	CougsSat-1: EPS	SKU:	68-0002
Designer:	Bradley L. Davis	Rev:	2.1.6
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A

B

C

D

A

B

C

D

J4MECH-TOP

PV 4,5

PV 6,7

Deploy
ables

Battery 1

PMIC SWD

Umb

RBF Pin

Battery 0

PV 0,1

PV 2,3

CougSat Card
68-0002

J4MECH-BOTTOM

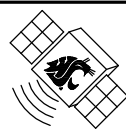
RBF
Switch

RBF Pin

CougSat Card
68-0002LOGO1
Satellite 16mmCougs in
Space

LOGO2

Signature

Cougs in
Space EE

Title: Mechanical

Size: A

Project: CougSat-1: EPS

SKU:68-0002

Designer: Bradley L. Davis

Rev: 2.1.6

Date: 11/4/2018 6:18 PM

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