



**ON Semiconductor®**

# USB-PD 4-Port Source

## Comment Legend

- - - - - Description
- - - - - Optional
- - - - - Not Required

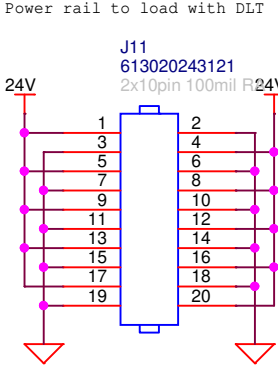
**ON Semiconductor**

Title USB-PD 4-Port Source		
Size Custom	Document Number ONSEC-17-038	Rev REV2
Date: Tuesday, February 12, 2019	Sheet 1	of 18

# 24V Input Filter

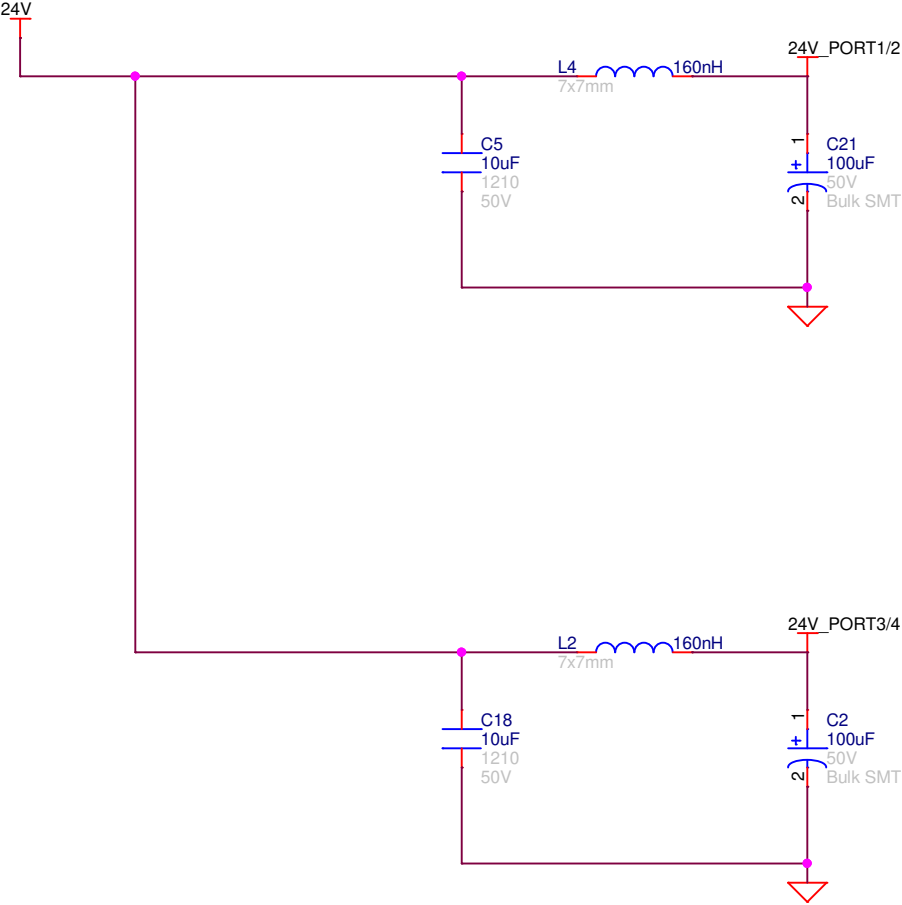
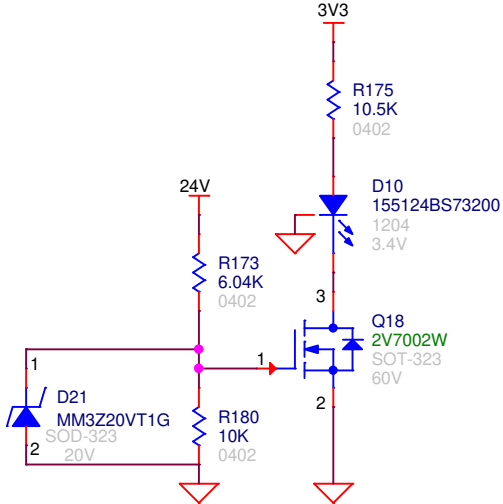
Strata Connected  
Not Required  
for Customer Design

### INPUT POWER HEADER



Indicator  
Optional for Customer Design

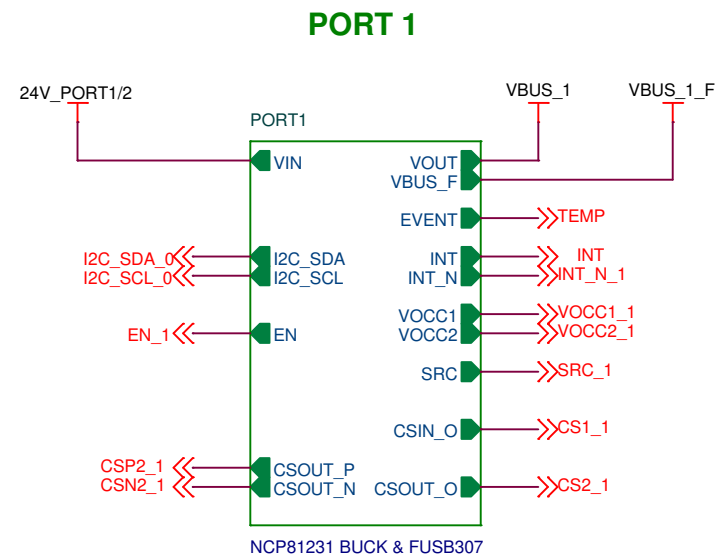
### INPUT VOLTAGE INDICATOR



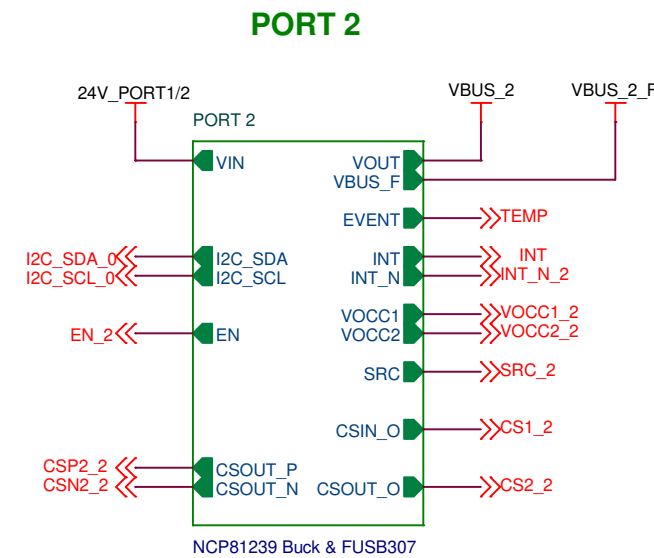
**ON Semiconductor**

Title 24V Input Filter		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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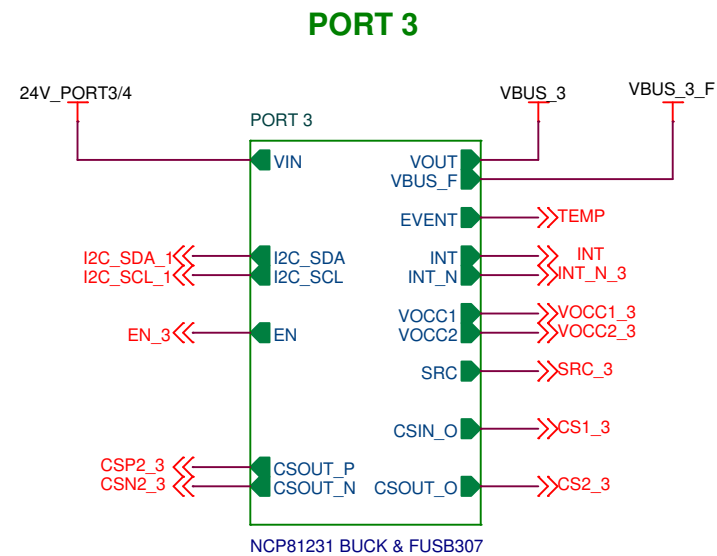
# NCP8123x Power Modules



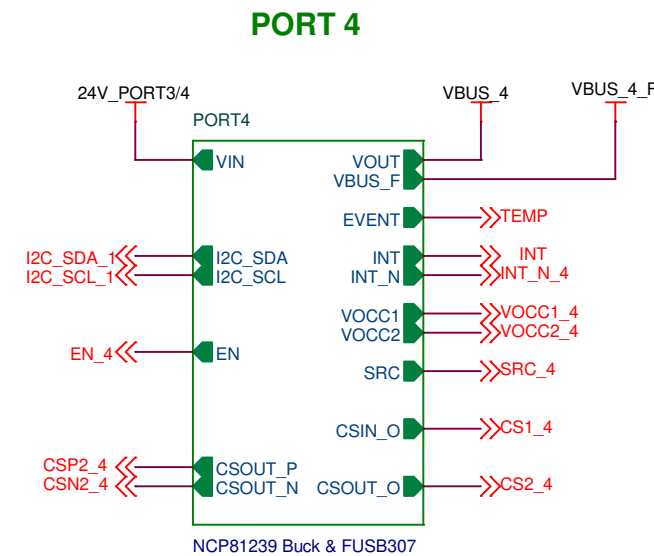
ADDRESSES:  
 0x77 NCP81231 Buck  
 0x50 FUSB307B Port Controller  
 0x1A N34TS04 Temp Sensor  
 0x52 N34TS04 EEPROM



ADDRESSES:  
 0x74 NCP81239 Buck  
 0x51 FUSB307B Port Controller  
 0x1B N34TS04 Temp Sensor  
 0x53 N34TS04 EEPROM



ADDRESSES:  
 0x77 NCP81231 Buck  
 0x50 FUSB307B Port Controller  
 0x1A N34TS04 Temp Sensor  
 0x52 N34TS04 EEPROM

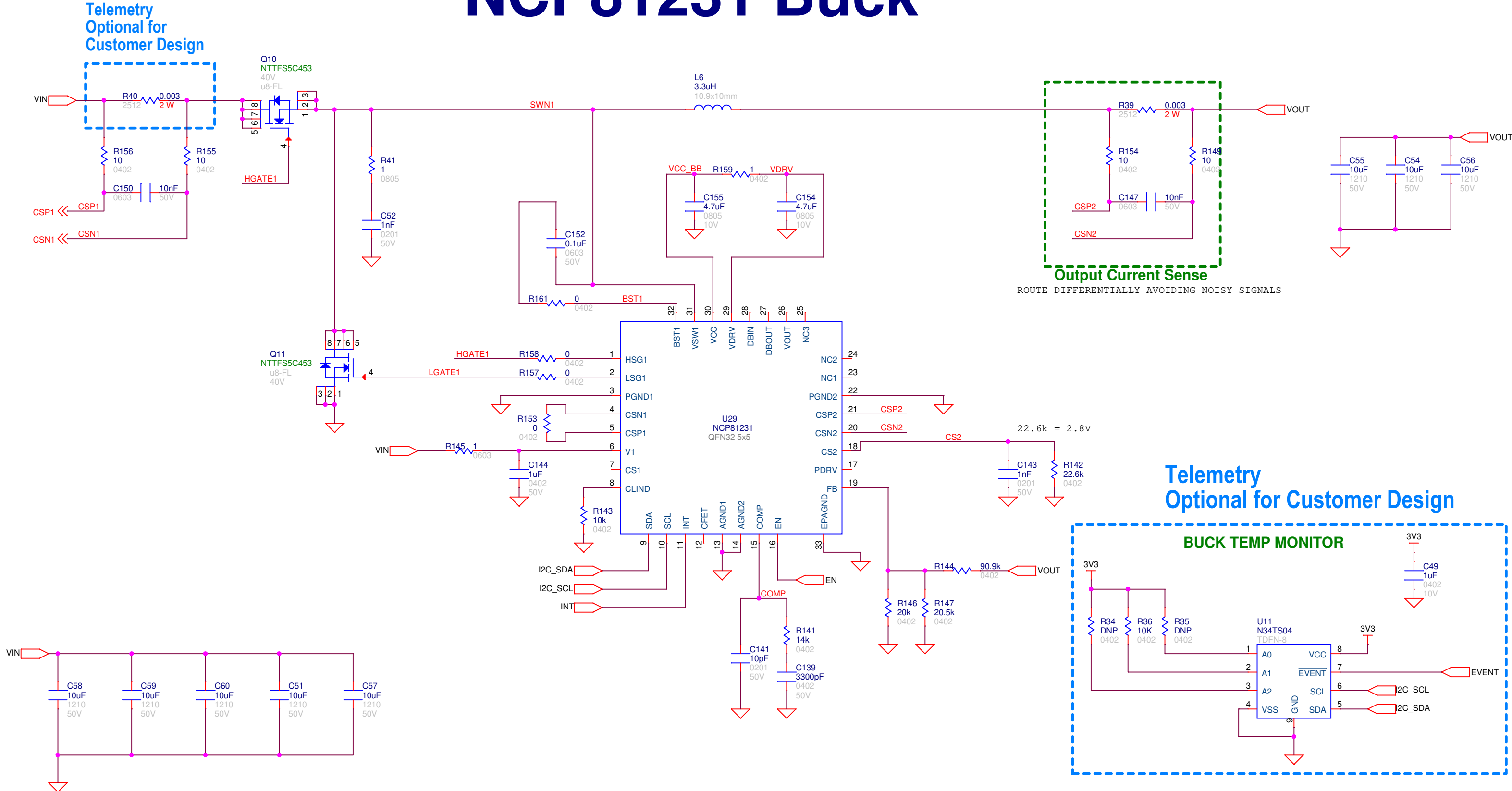


ADDRESSES:  
 0x74 NCP81239 Buck  
 0x51 FUSB307B Port Controller  
 0x1B N34TS04 Temp Sensor  
 0x53 N34TS04 EEPROM

**ON Semiconductor**

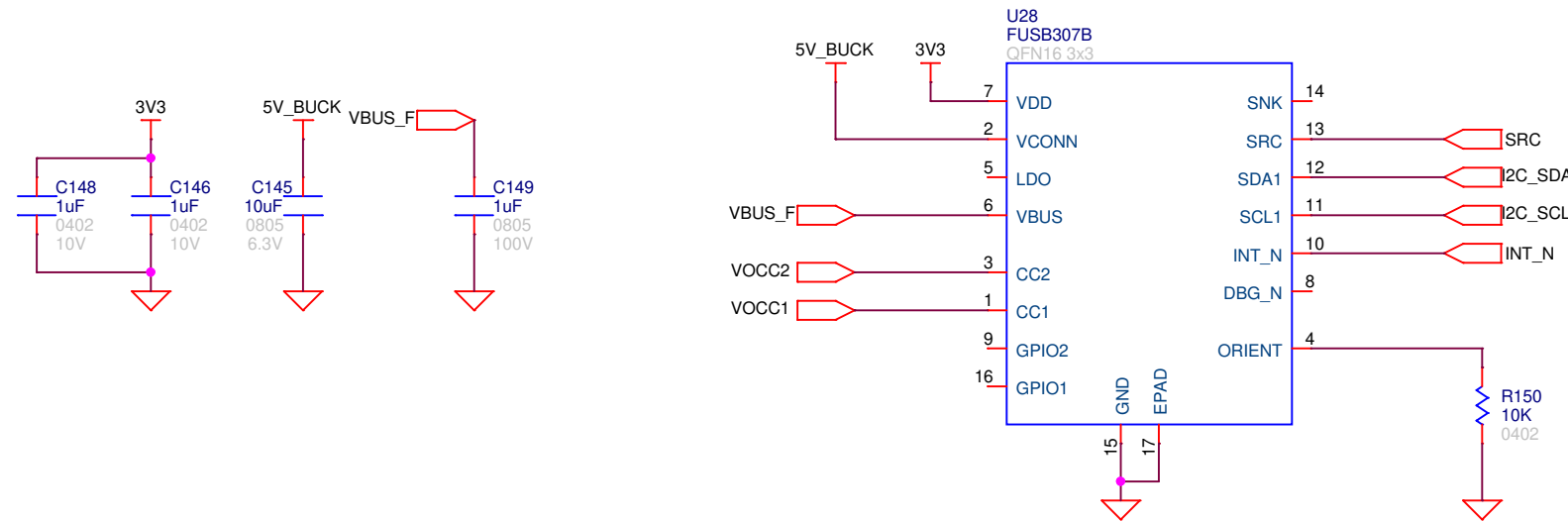
Title NCP8123x Power Modules		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# NCP81231 Buck



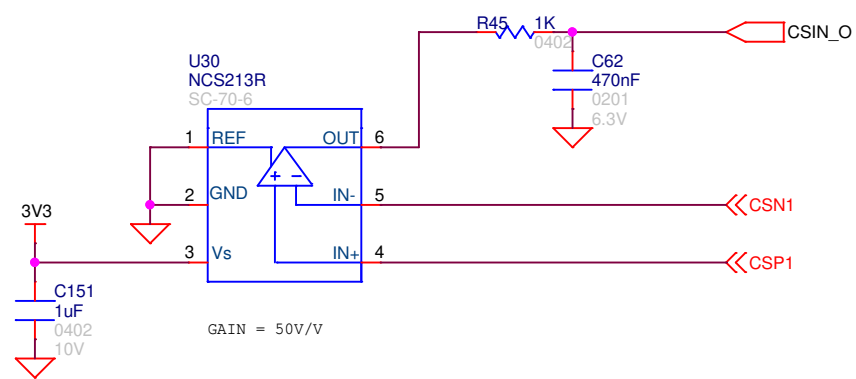
# Port Controller and Current Sense

## FUSB307B PORT CONTROLLER



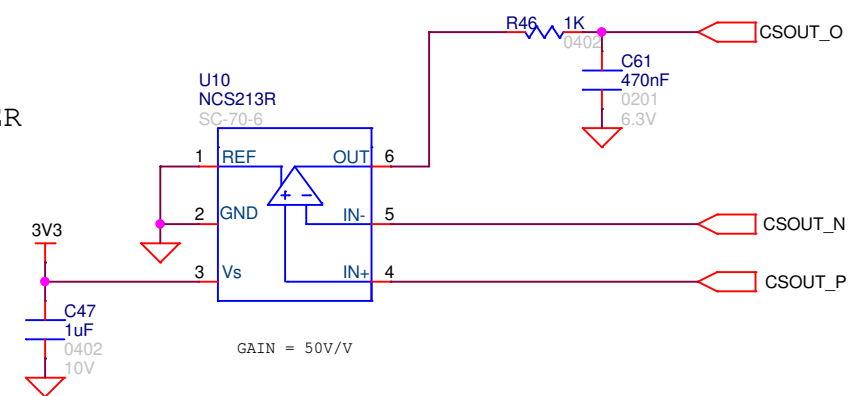
## Telemetry Optional for Customer Design

### INPUT CURRENT SENSE



VERIFY CSOUT DOES NOT EXCEED MAX VOLTAGE GOING TO THE MICROCONTROLLER

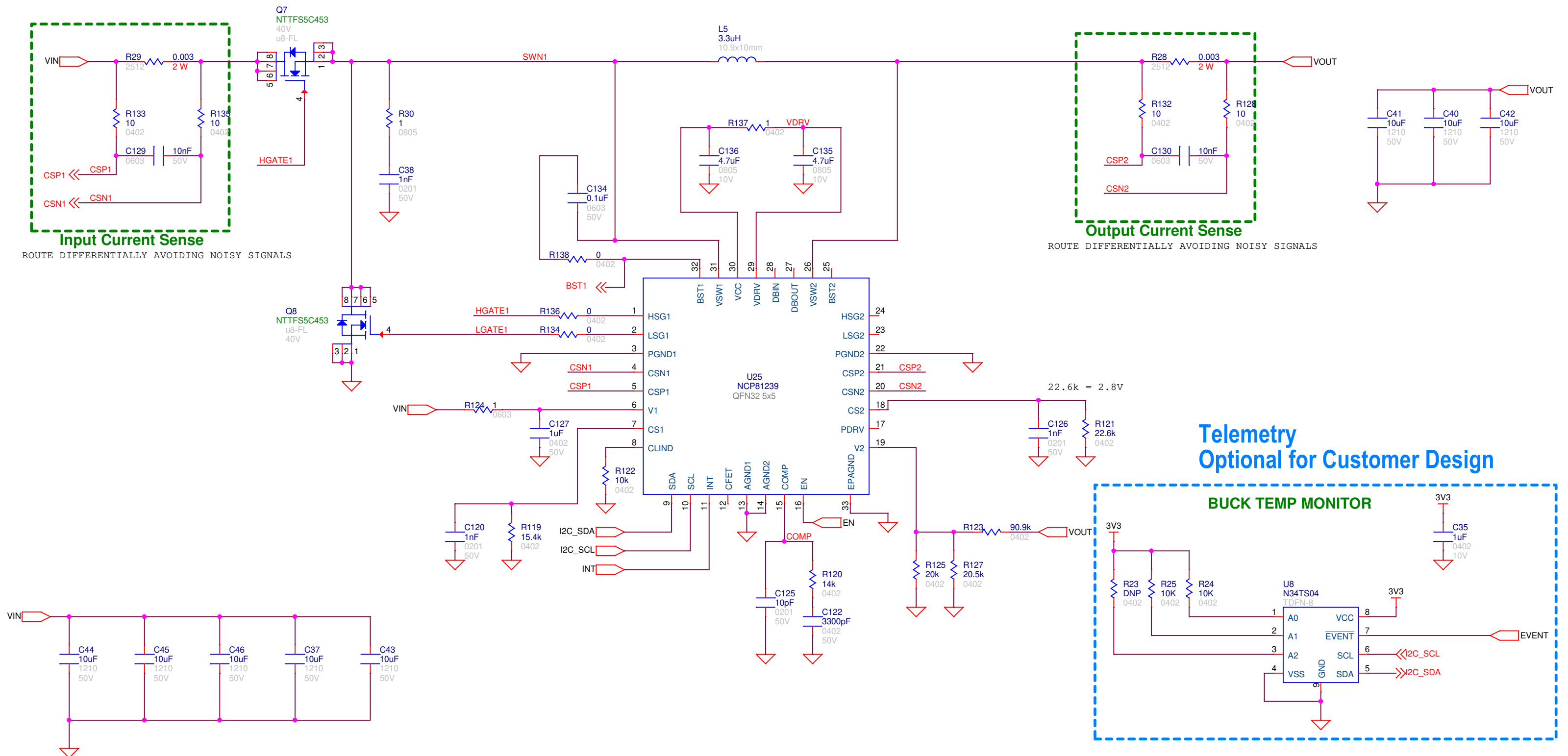
### OUTPUT CURRENT SENSE



**ON Semiconductor**

Title Port Controller and Current Sense		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# NCP81239 Buck



**Input Current Sense**  
ROUTE DIFFERENTIALLY AVOIDING NOISY SIGNALS

**Output Current Sense**  
ROUTE DIFFERENTIALLY AVOIDING NOISY SIGNALS

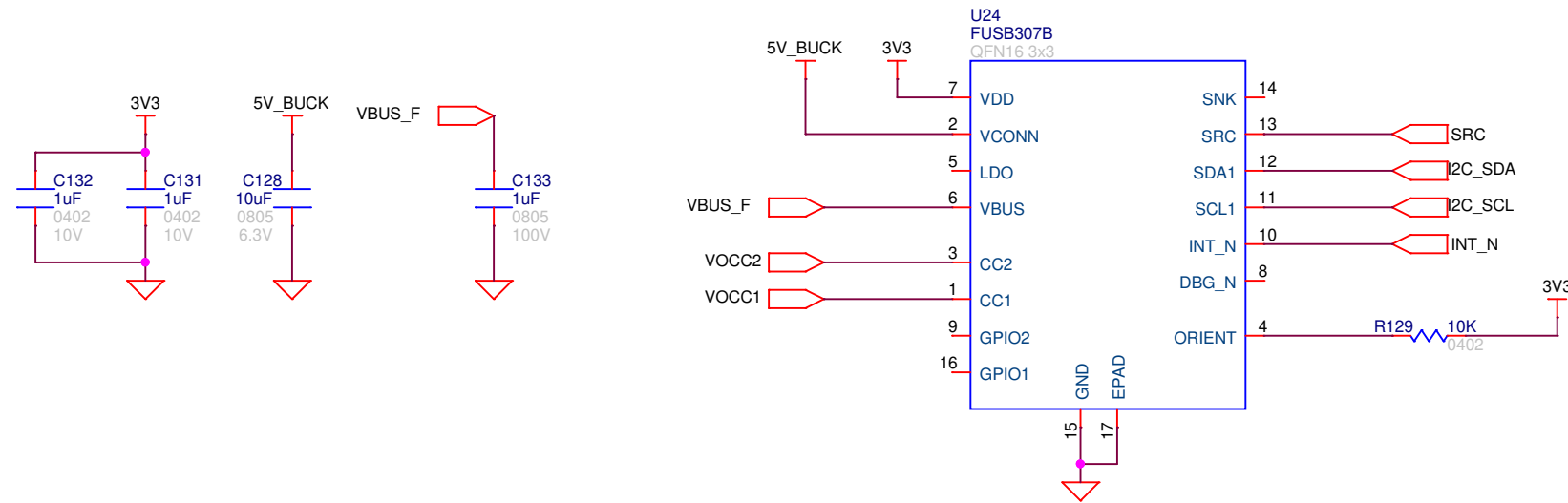
**Telemetry**  
Optional for Customer Design

**BUCK TEMP MONITOR**

<b>ON Semiconductor</b>		
Title NCP81239 Buck		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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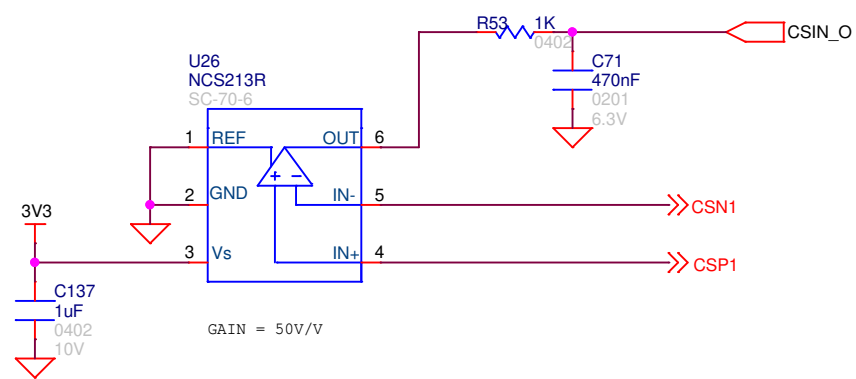
# Port Controller and Current Sense

## FUSB307B PORT CONTROLLER



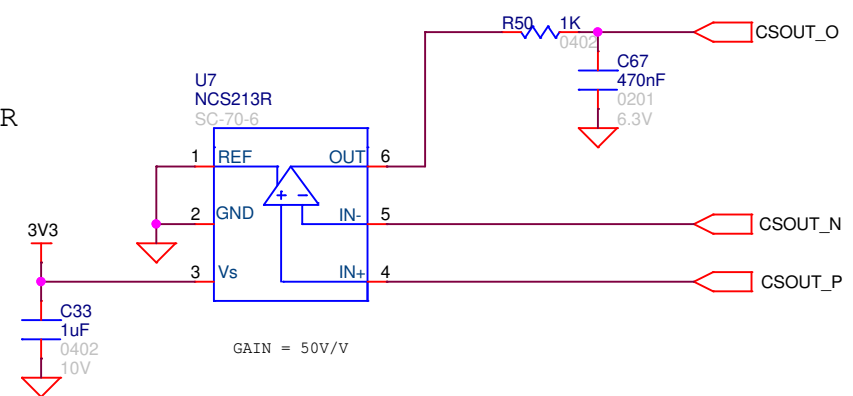
## Telemetry Optional for Customer Design

### INPUT CURRENT SENSE



VERIFY CSOUT DOES NOT EXCEED MAX VOLTAGE GOING TO THE MICROCONTROLLER

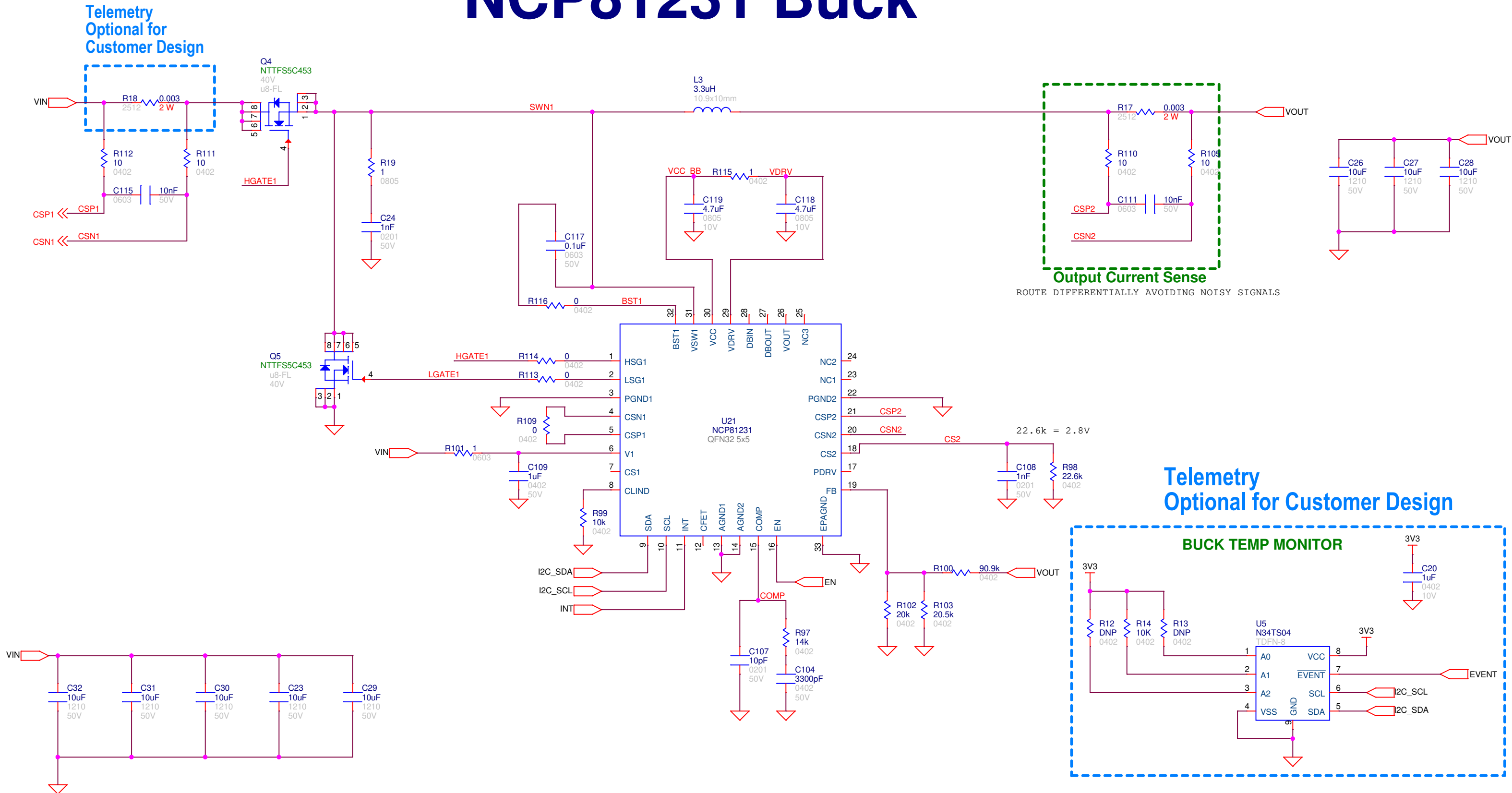
### OUTPUT CURRENT SENSE



**ON Semiconductor**

Title Port Controller and Current Sense		
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# NCP81231 Buck



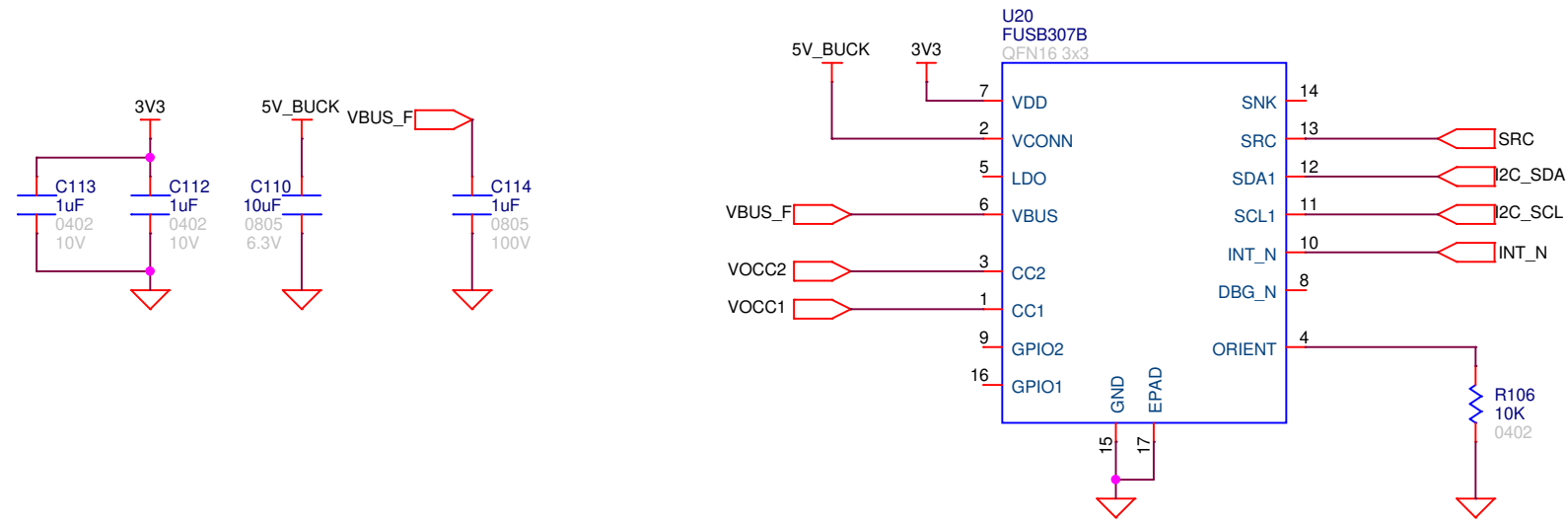
**ON Semiconductor**

Title NCP81231 Buck		
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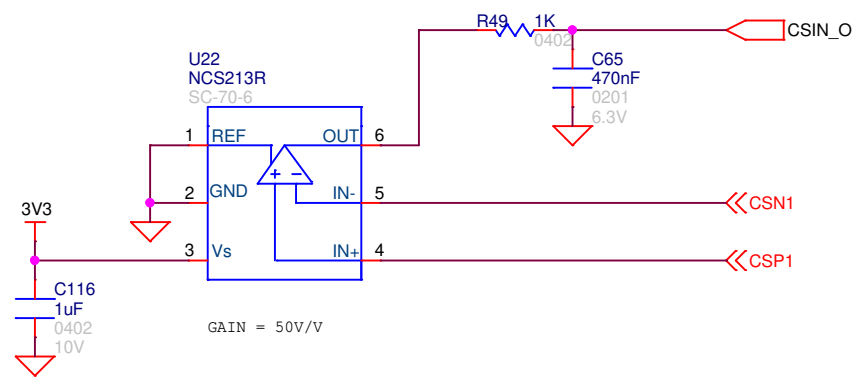
# Port Controller and Current Sense

## FUSB307B PORT CONTROLLER



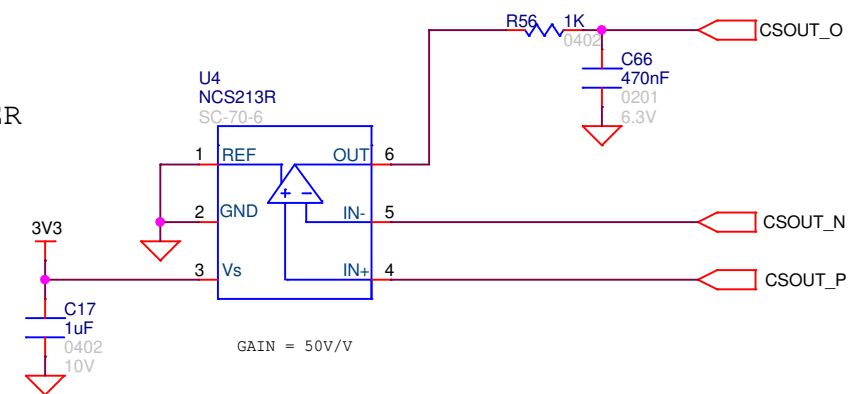
## Telemetry Optional for Customer Design

### INPUT CURRENT SENSE



VERIFY CSOUT DOES NOT EXCEED MAX VOLTAGE GOING TO THE MICROCONTROLLER

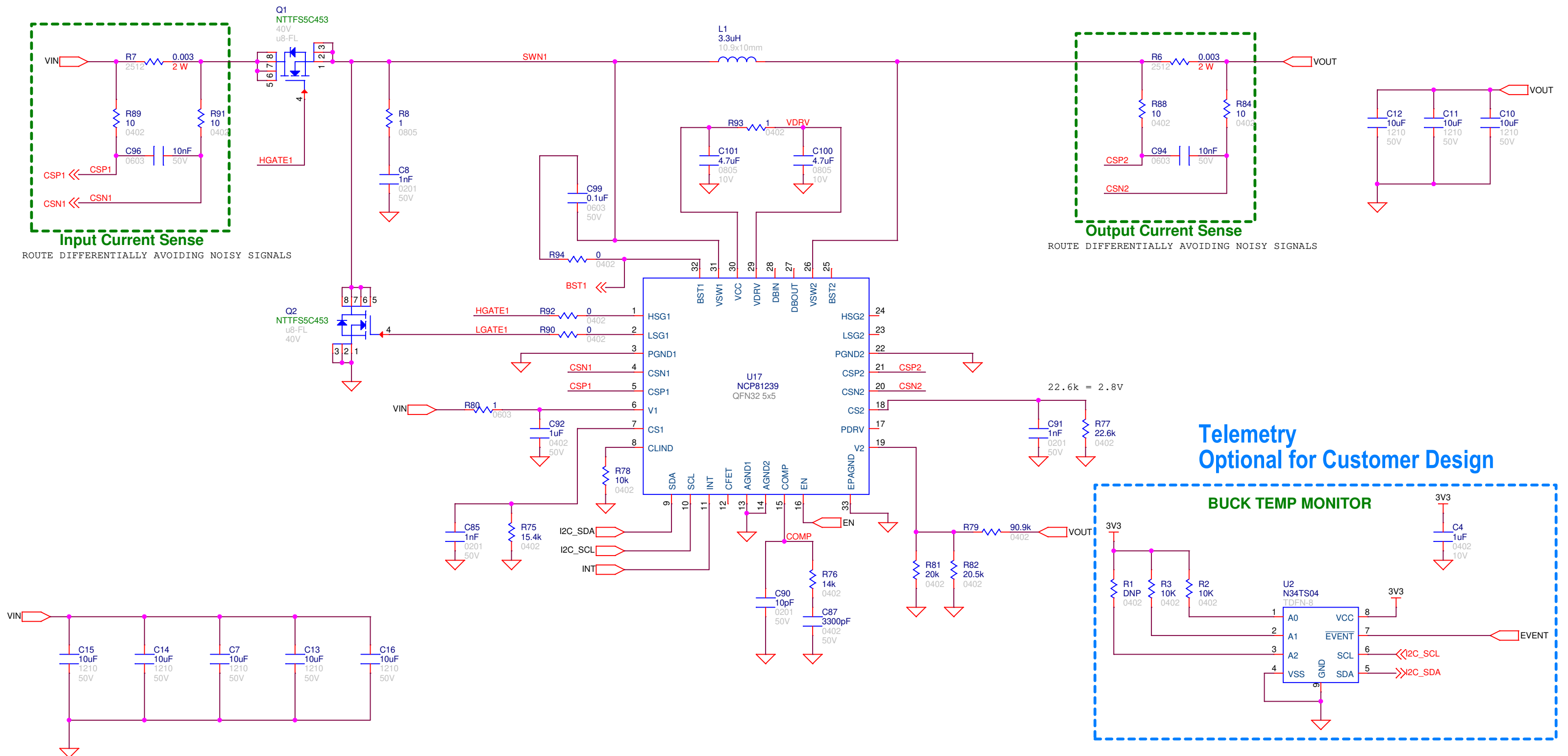
### OUTPUT CURRENT SENSE



**ON Semiconductor**

Title Port Controller and Current Sense		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# NCP81239 Buck



**Input Current Sense**  
ROUTE DIFFERENTIALLY AVOIDING NOISY SIGNALS

**Output Current Sense**  
ROUTE DIFFERENTIALLY AVOIDING NOISY SIGNALS

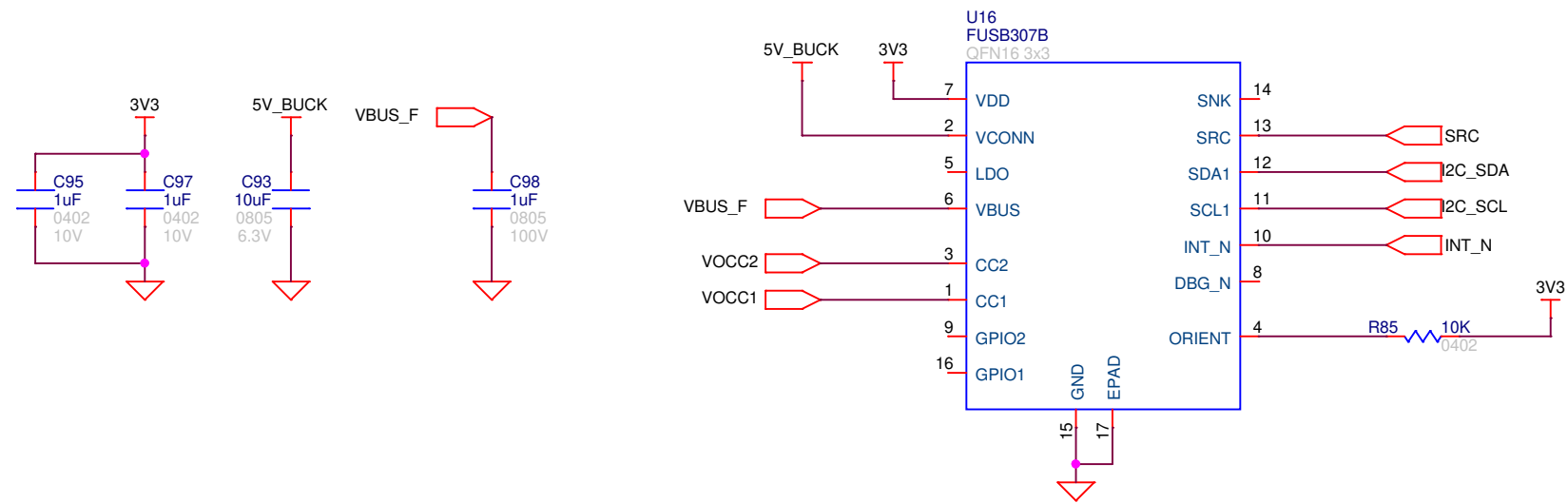
**Telemetry**  
Optional for Customer Design

**BUCK TEMP MONITOR**

<b>ON Semiconductor</b>		
Title NCP81239 Buck		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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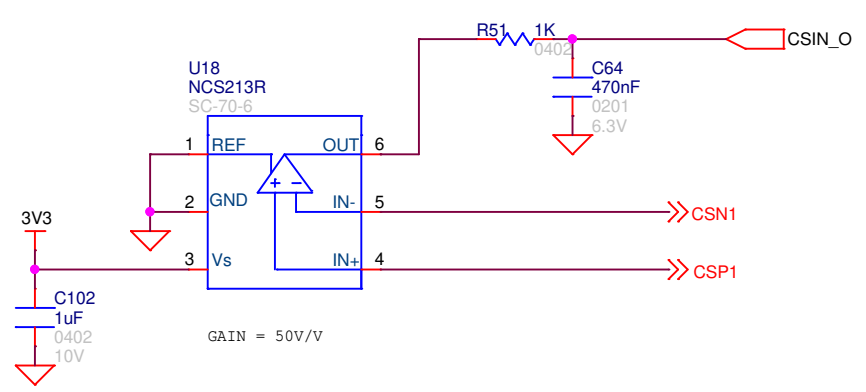
# Port Controller and Current Sense

## FUSB307B PORT CONTROLLER



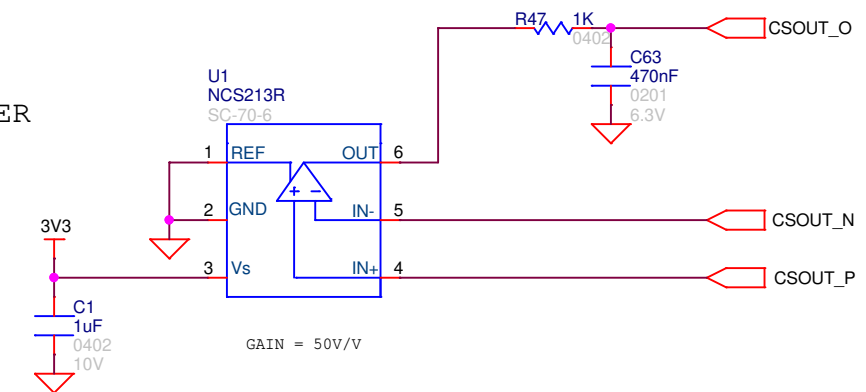
## Telemetry Optional for Customer Design

### INPUT CURRENT SENSE



VERIFY CSOUT DOES NOT EXCEED MAX VOLTAGE GOING TO THE MICROCONTROLLER

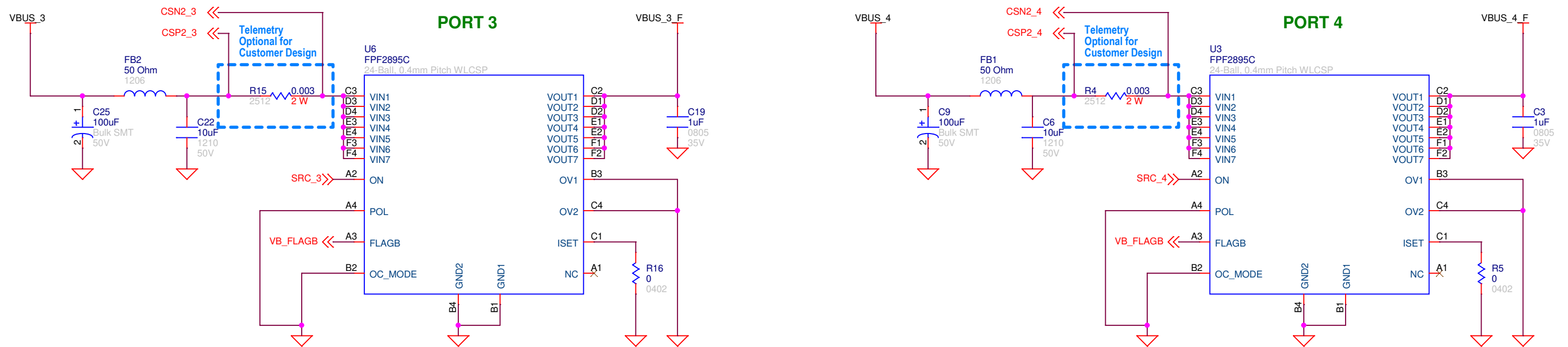
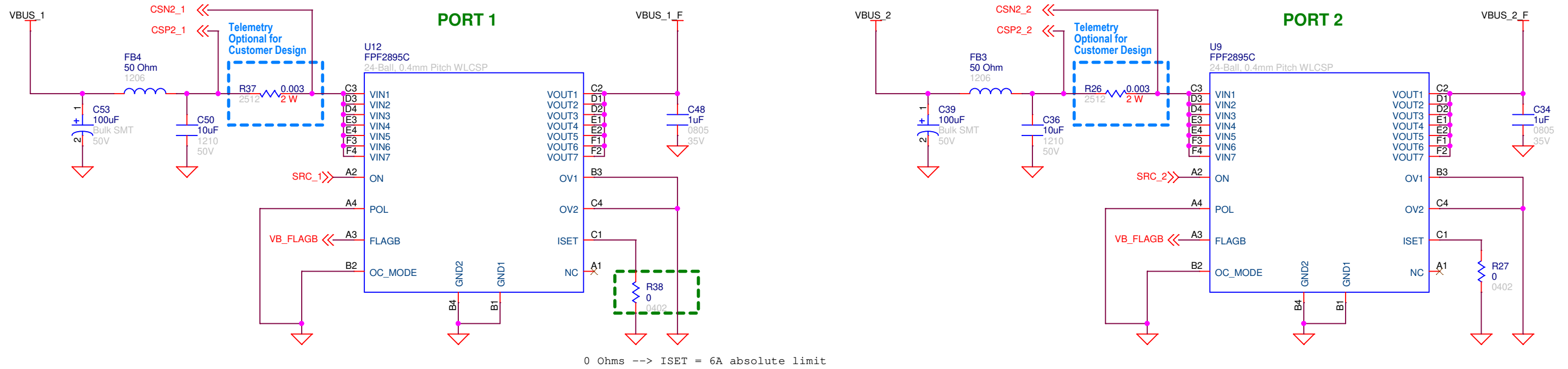
### OUTPUT CURRENT SENSE



**ON Semiconductor**

Title Port Controller and Current Sense		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# Port Power Disconnect

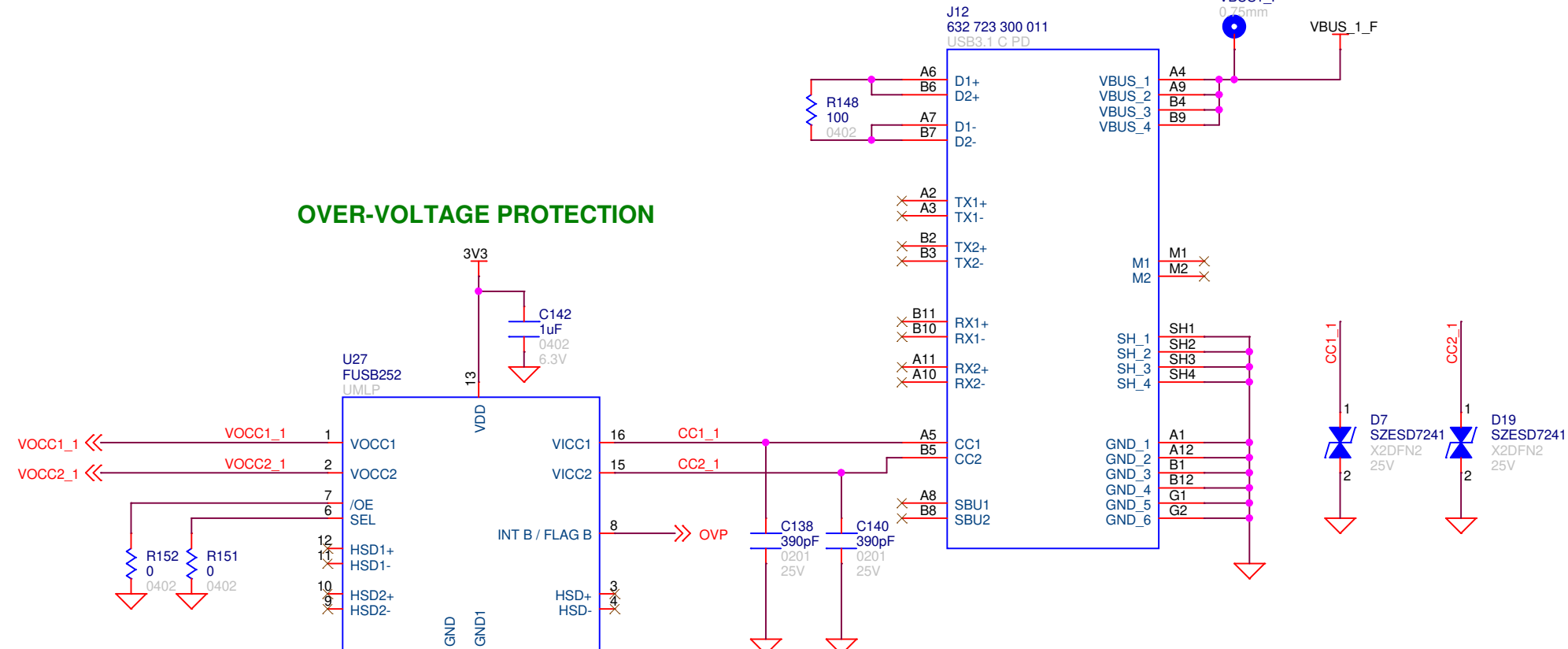


**ON Semiconductor**

Title Port Power Disconnect		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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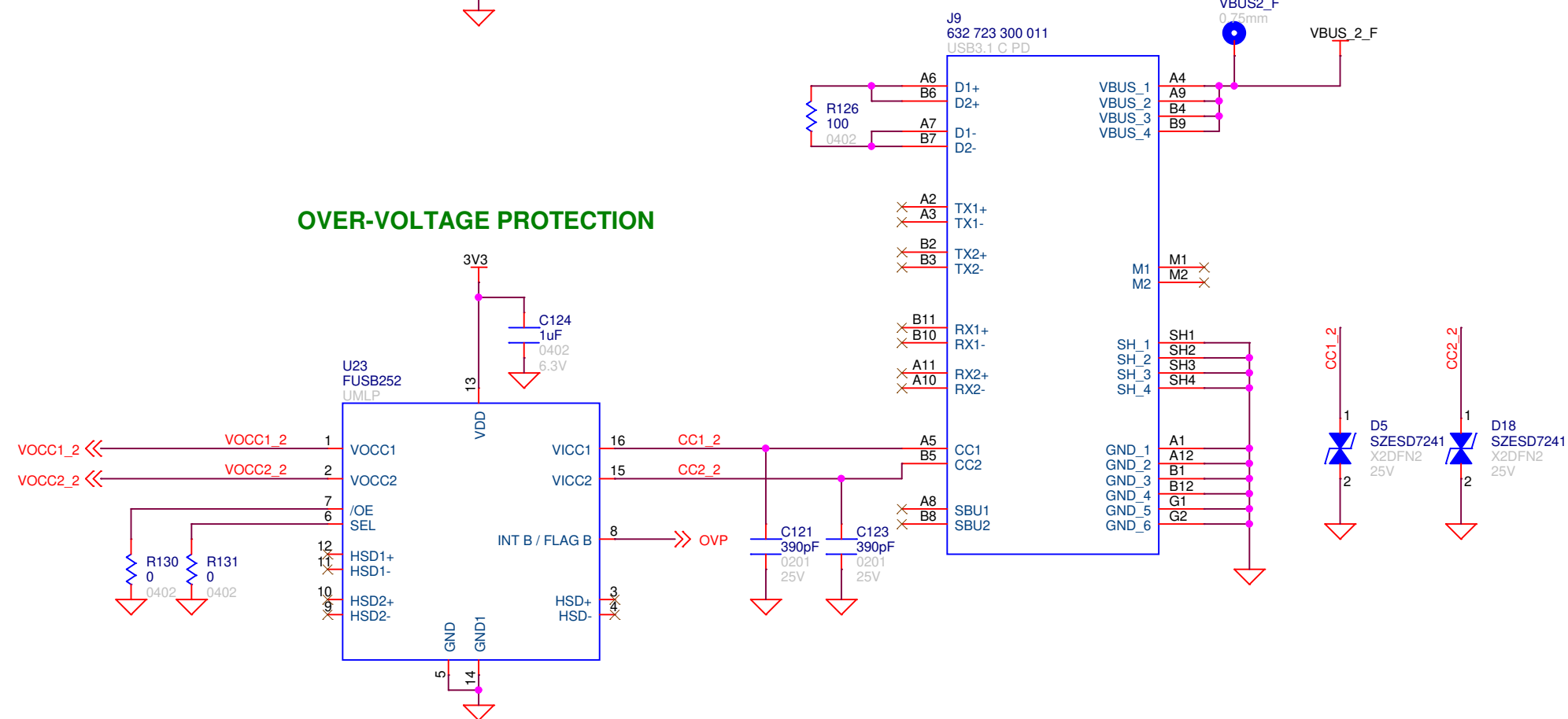
# FUSB252 and USBC Connector

## USB TYPE-C RECEPTACLE



## OVER-VOLTAGE PROTECTION

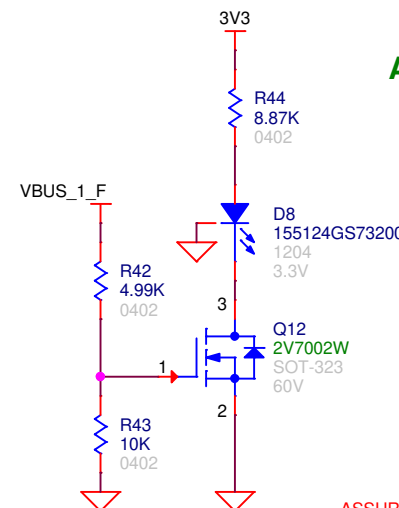
## USB TYPE-C RECEPTACLE



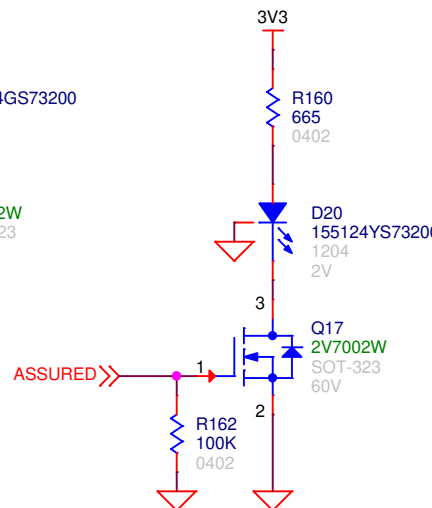
## OVER-VOLTAGE PROTECTION

## Indicator Optional for Customer Design

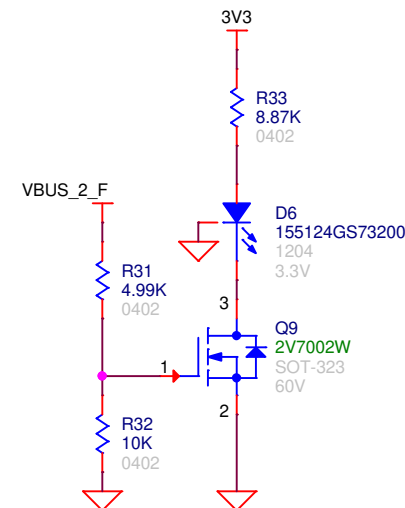
### OUTPUT VOLTAGE INDICATOR



### ASSURED PORT INDICATOR



### OUTPUT VOLTAGE INDICATOR



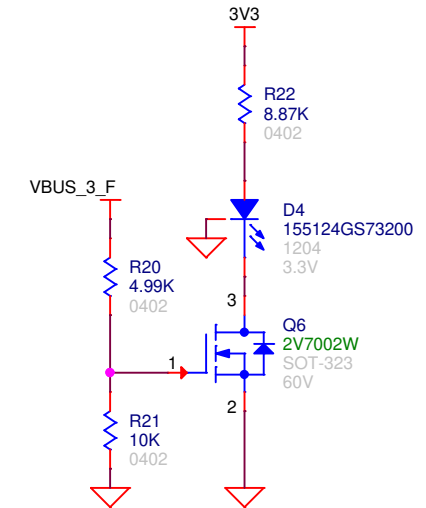
**ON Semiconductor**

Title FUSB252 and USBC Connector 1		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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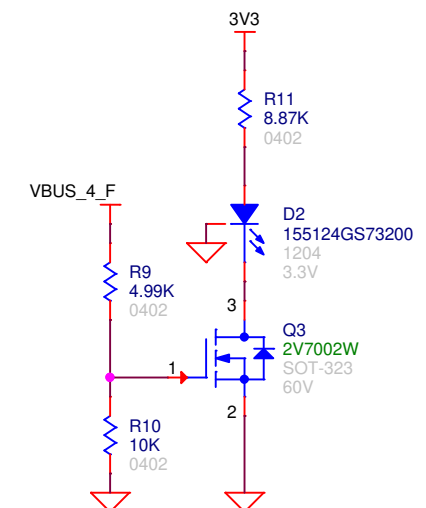
# FUSB252 and USBC Connector

Indicator  
Optional for Customer Design

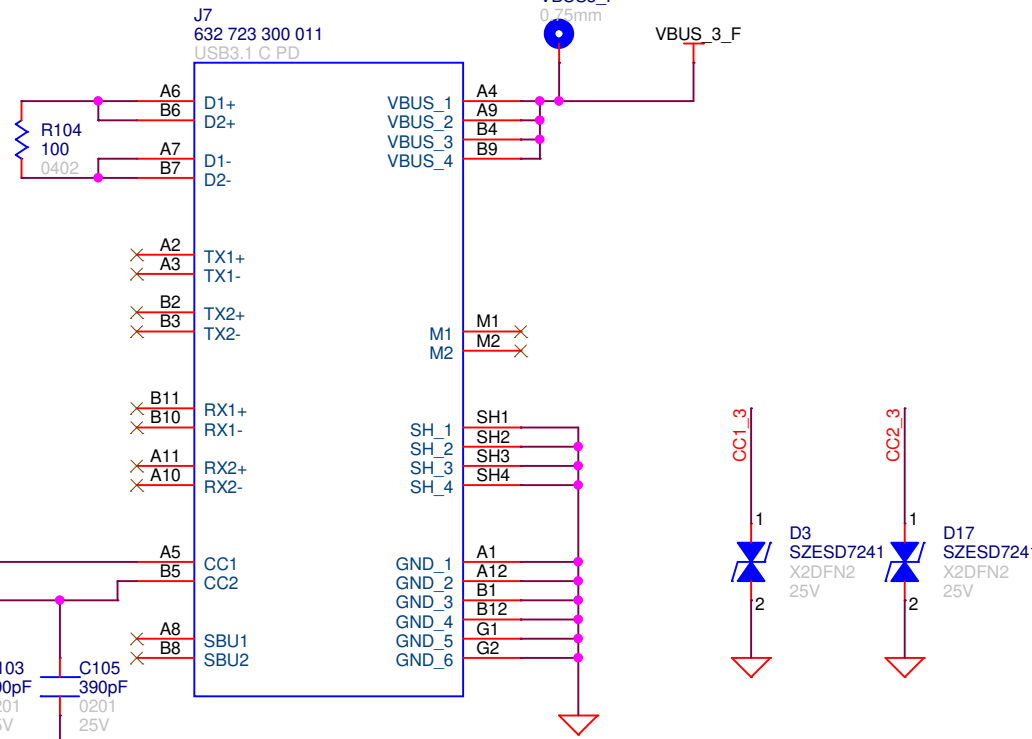
## OUTPUT VOLTAGE INDICATOR



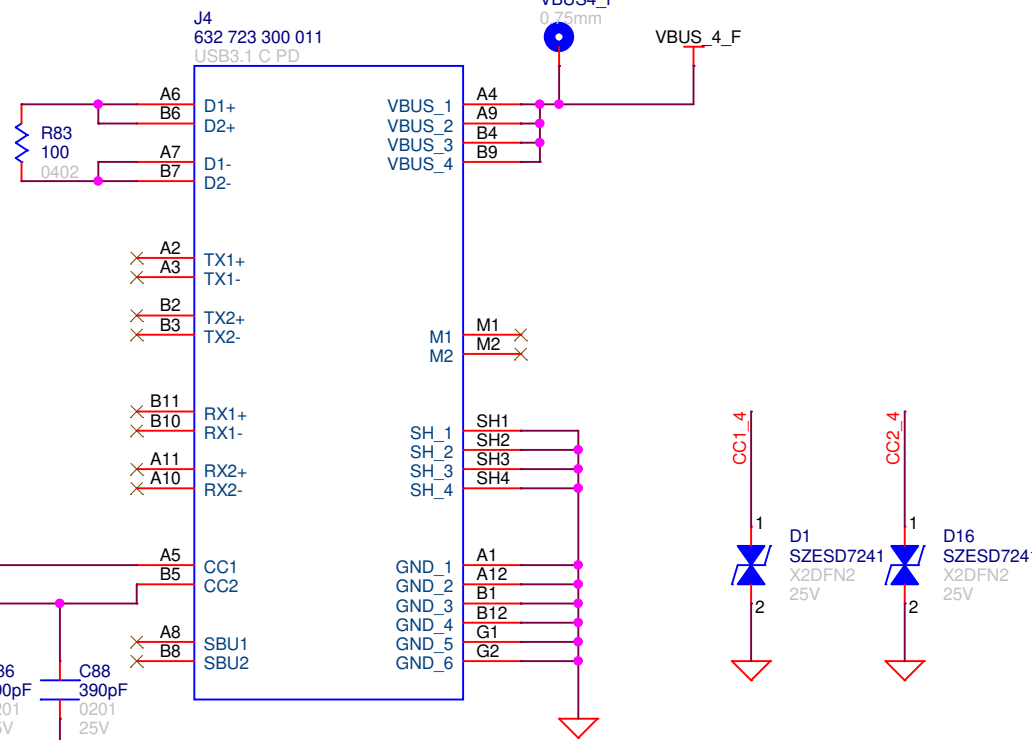
## OUTPUT VOLTAGE INDICATOR



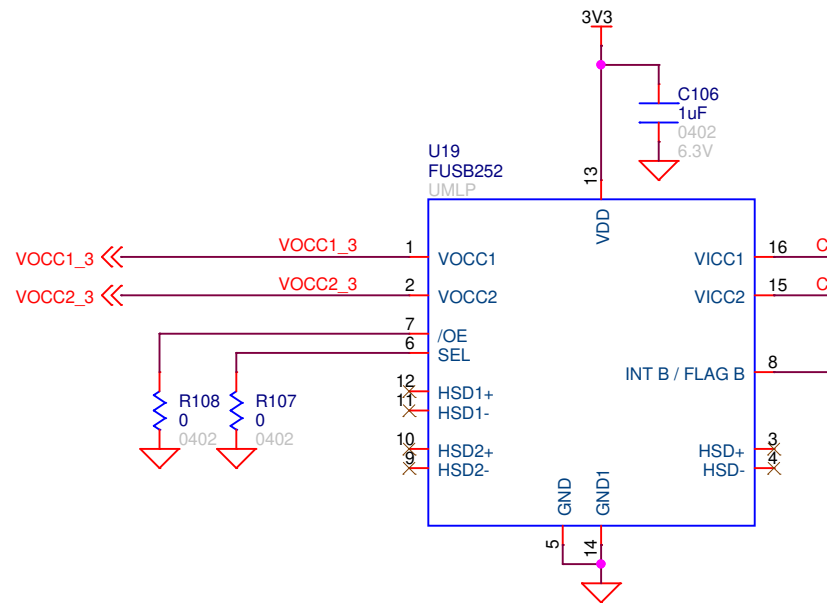
## USB TYPE-C RECEPTACLE



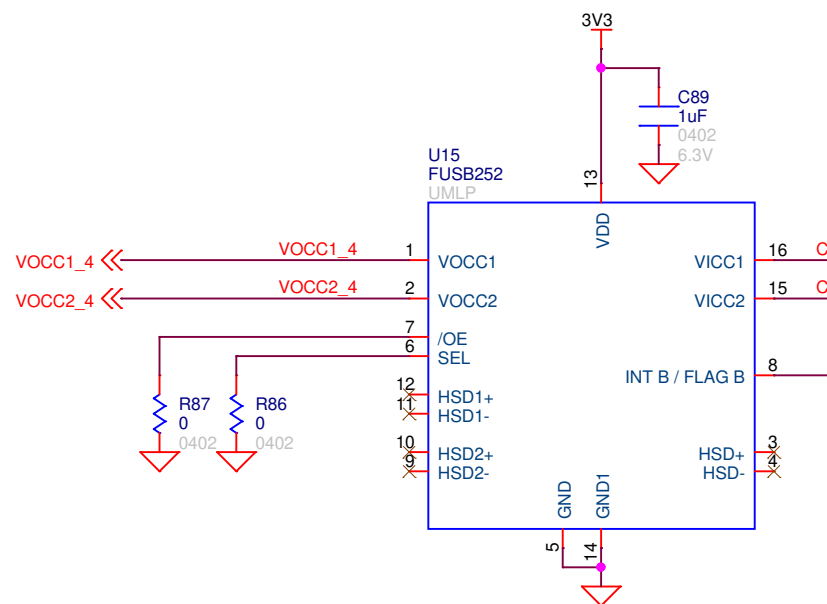
## USB TYPE-C RECEPTACLE



## OVER-VOLTAGE PROTECTION



## OVER-VOLTAGE PROTECTION

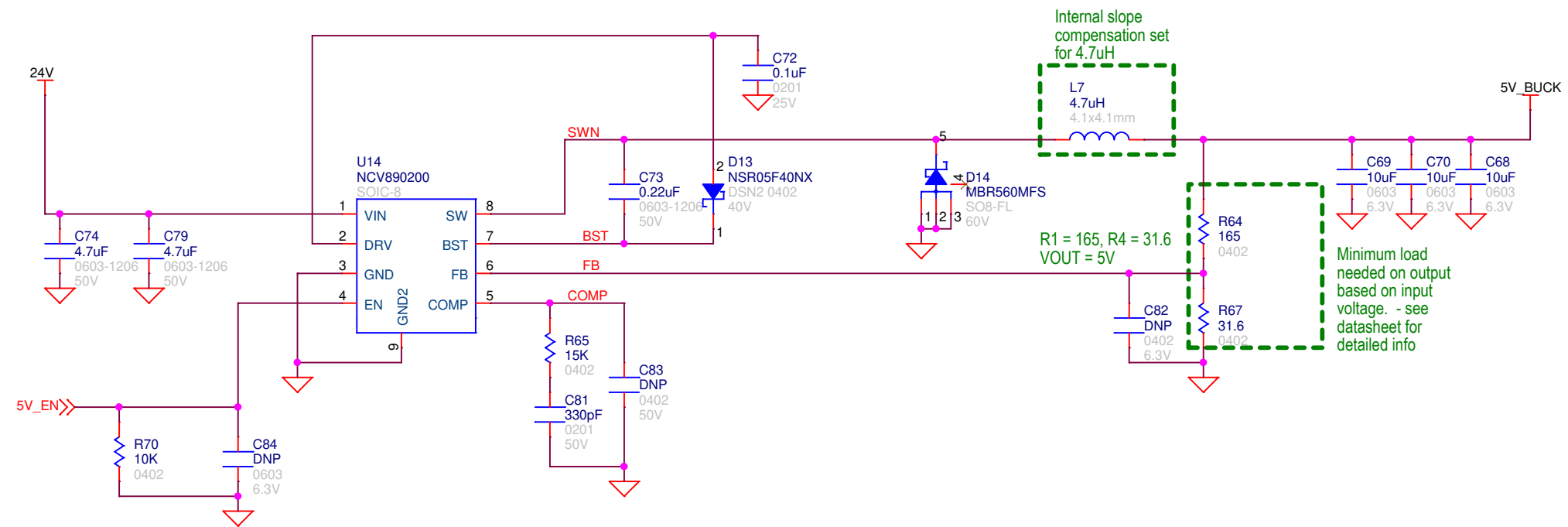


**ON Semiconductor**

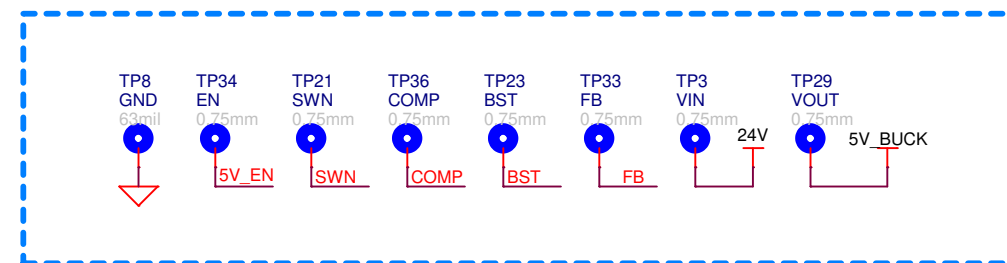
Title FUSB252 and USBC Connector 2		
Size Custom	Document Number ONSEC-17-038	Rev REV2
Date: Thursday, March 28, 2019	Sheet 14	of 18

# NCV890200 5V Regulator

## 5V / 2A NON-SYNCHRONOUS BUCK



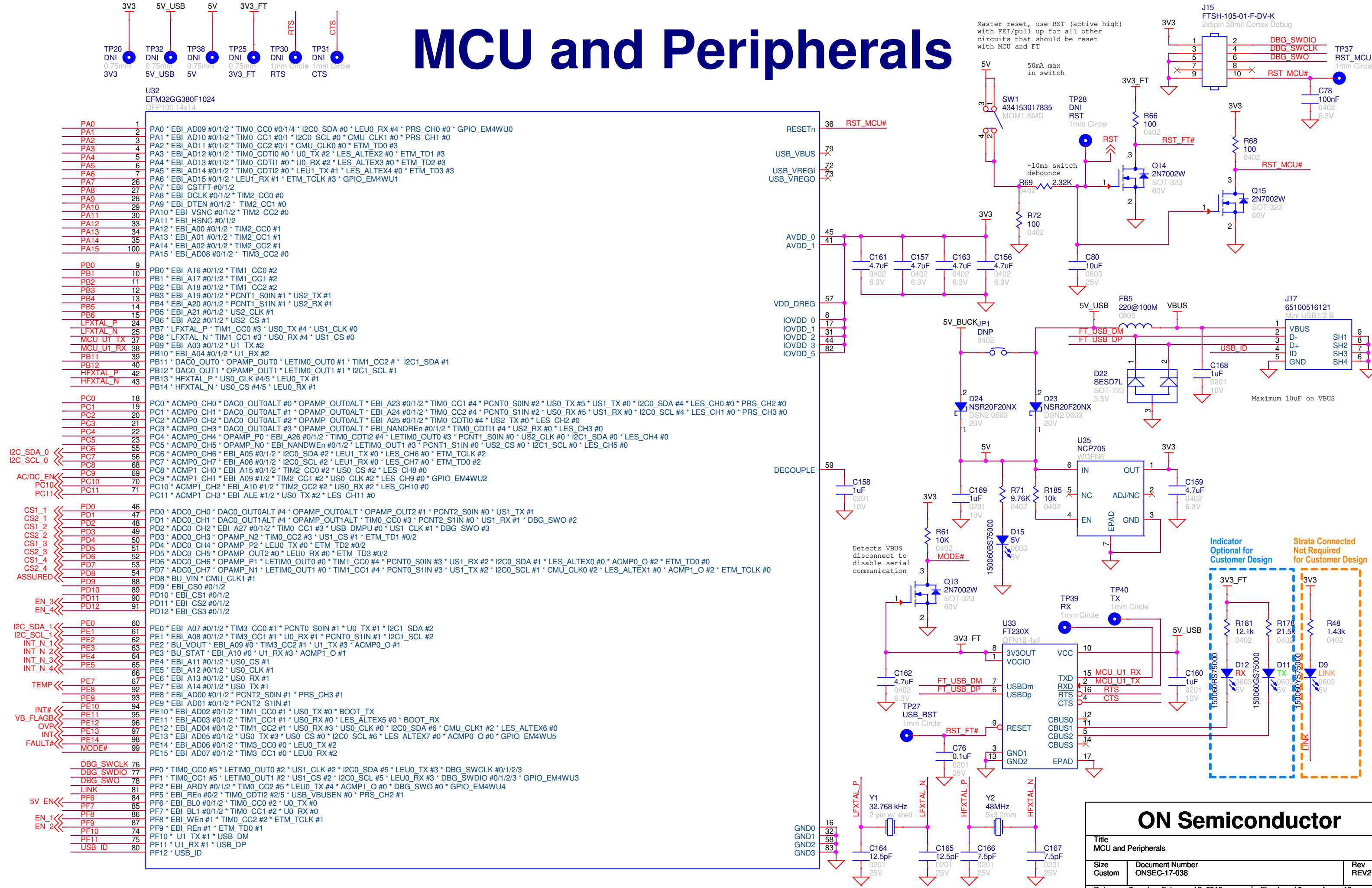
## Test Circuitry Optional for Customer Design



**ON Semiconductor**

Title NCV890200 5V Regulator		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# MCU and Peripherals



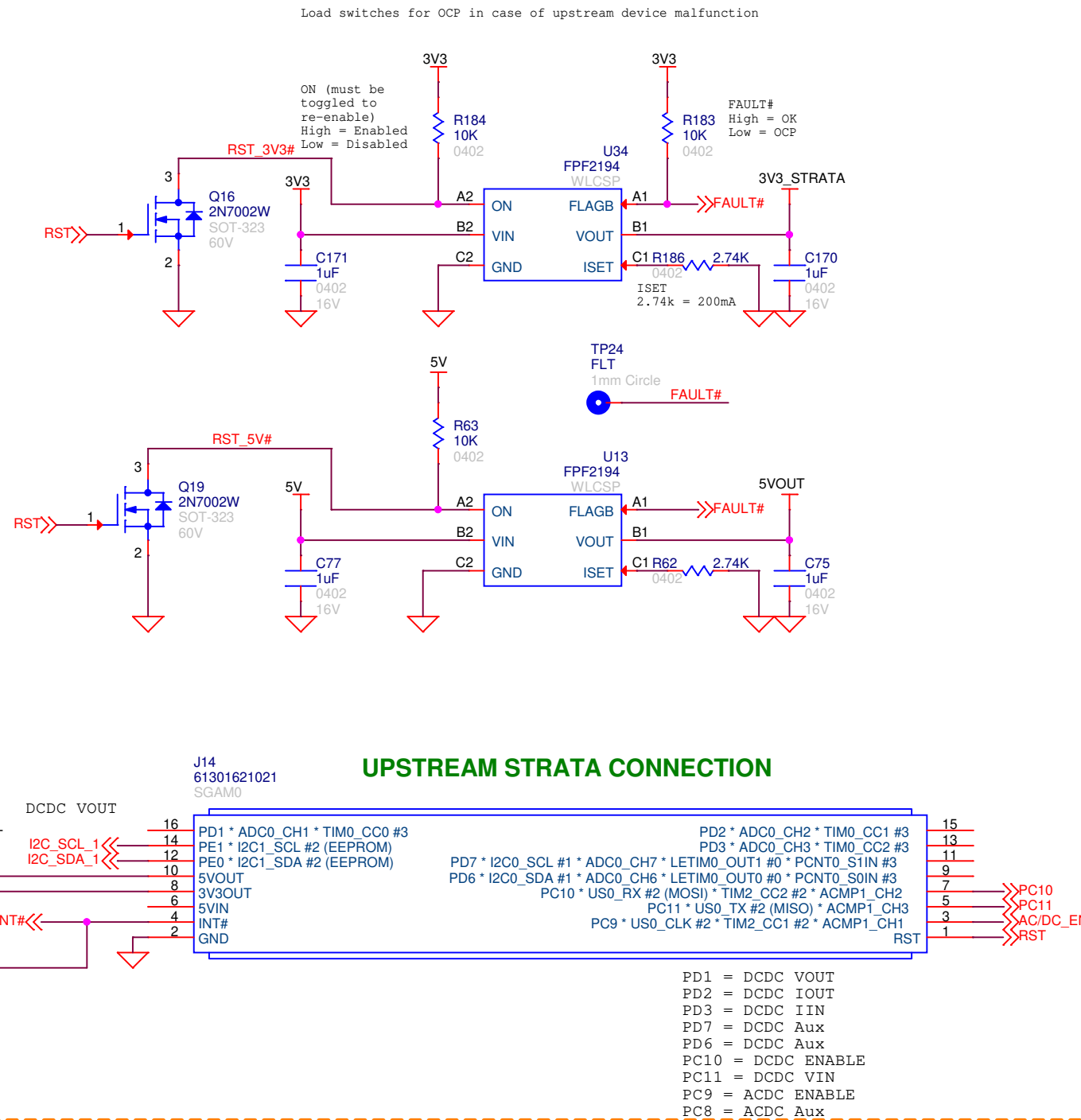
**ON Semiconductor**

Title MCU and Peripherals		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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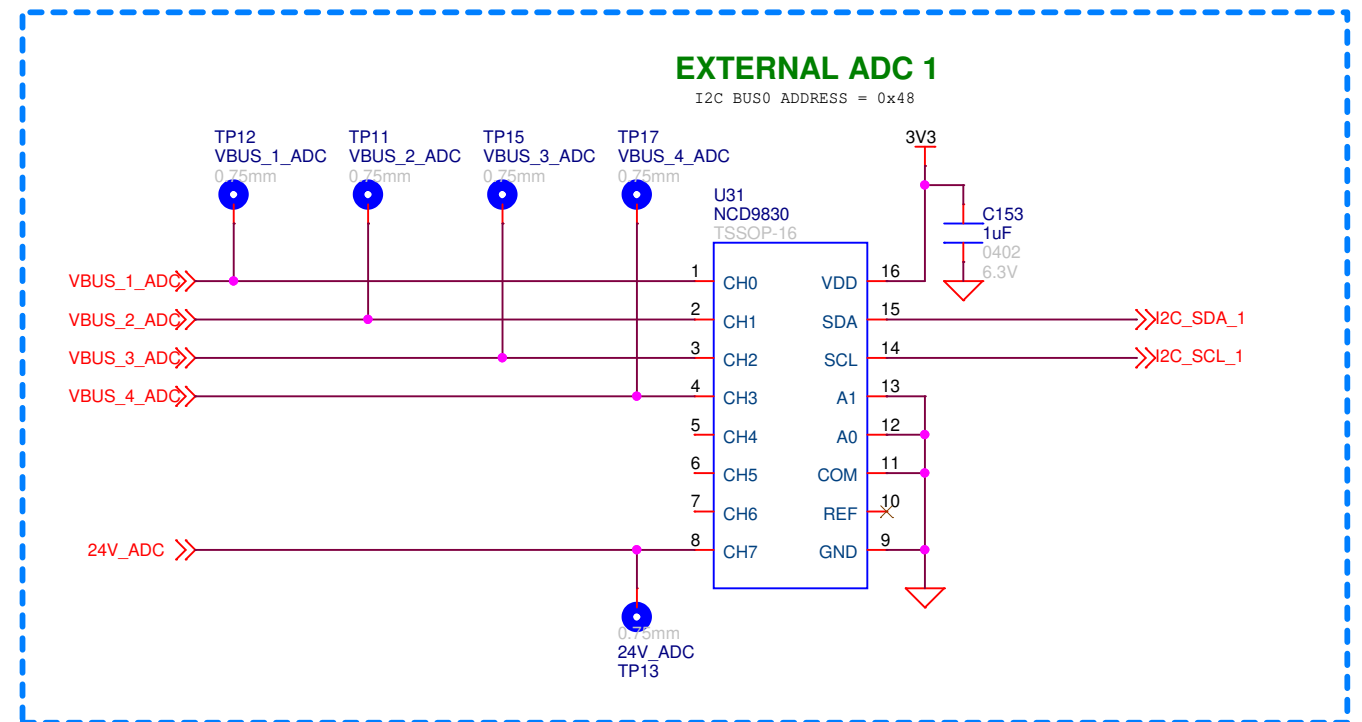


# STRATA CONN & ADC

Strata Connected  
Not Required for Customer Design



Telemetry  
Optional for Customer Design



## Minimum MCU Requirements:

- Bit-width: 32-bit, 16-bit or 8-bit require significant porting effort and increase code size
- Speed: 12 MHz
- Flash: 32 kB - 128 kB depending on feature set and optimizations
- RAM: 2 kB per port + additional if logging is required
- Peripherals: (1) I2C - 1MHz recommended (2) Timers - 32-bit w/ 1us resolution & 16-bit w/ 1ms resolution, 8-bit ADC if using telemetry, (2) GPIO with falling-edge interrupt capability

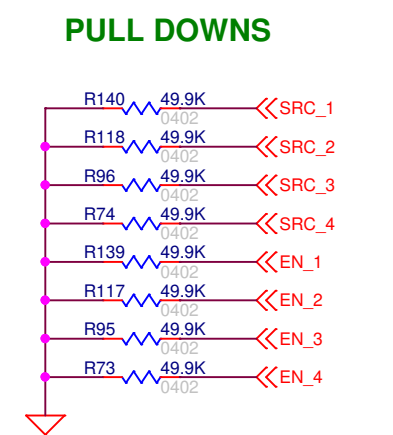
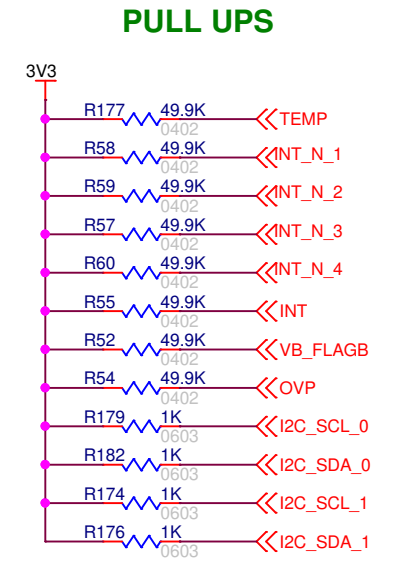
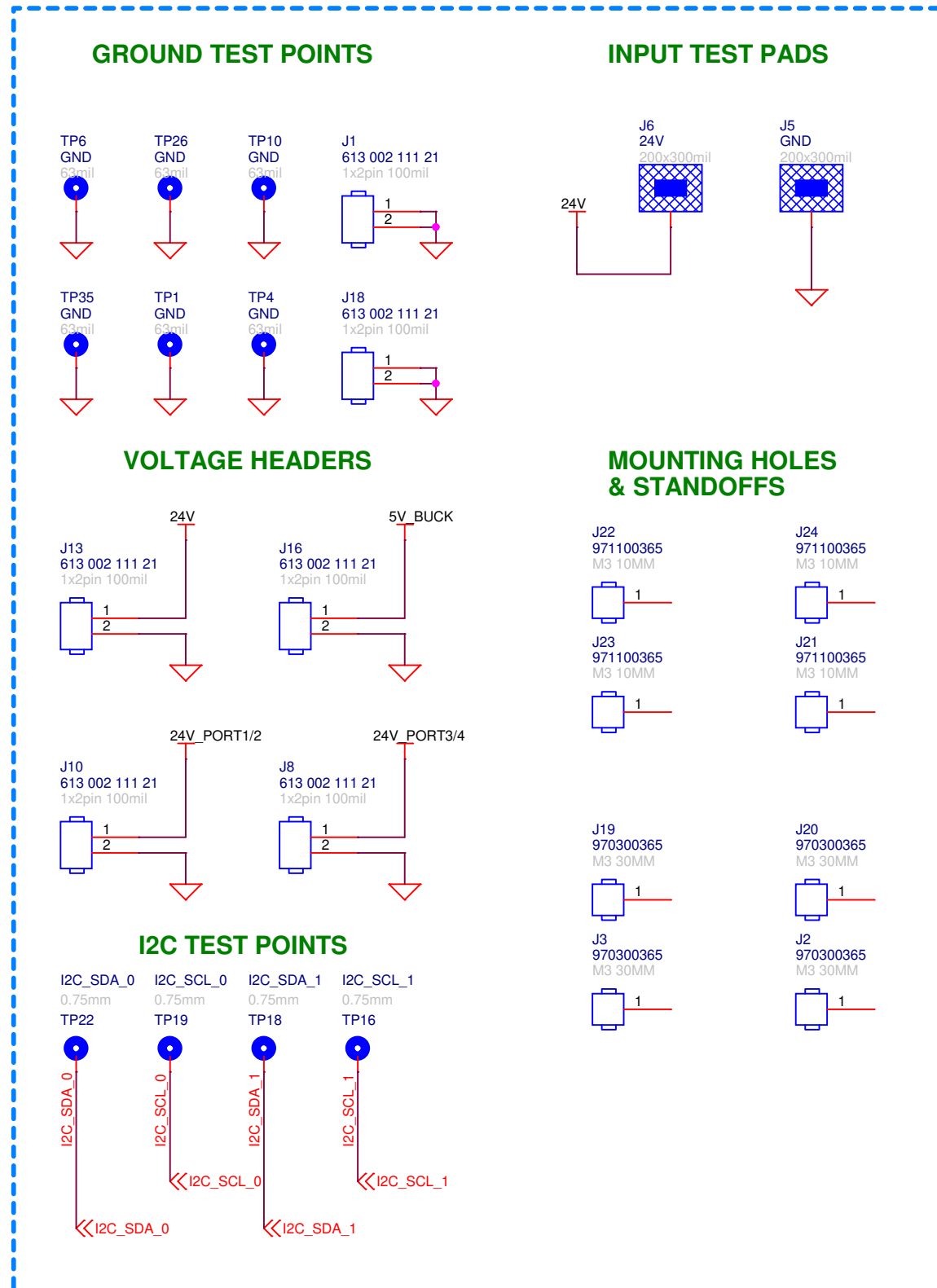
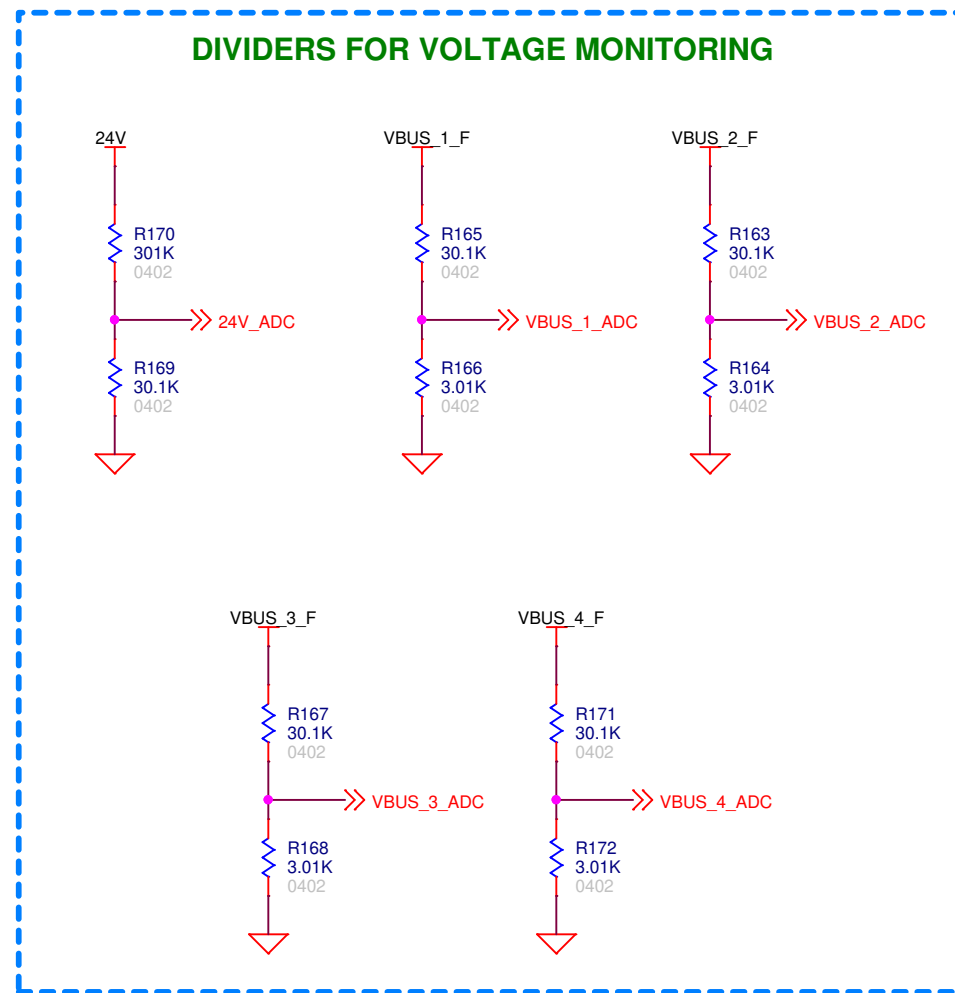
**ON Semiconductor**

Title STRATA CONN & ADC		
Size Custom	Document Number ONSEC-17-038	Rev REV2
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# Test Circuitry

## Test Circuitry Optional for Customer Design

### Telemetry Optional for Customer Design



<b>ON Semiconductor</b>		
Title Test Circuitry		
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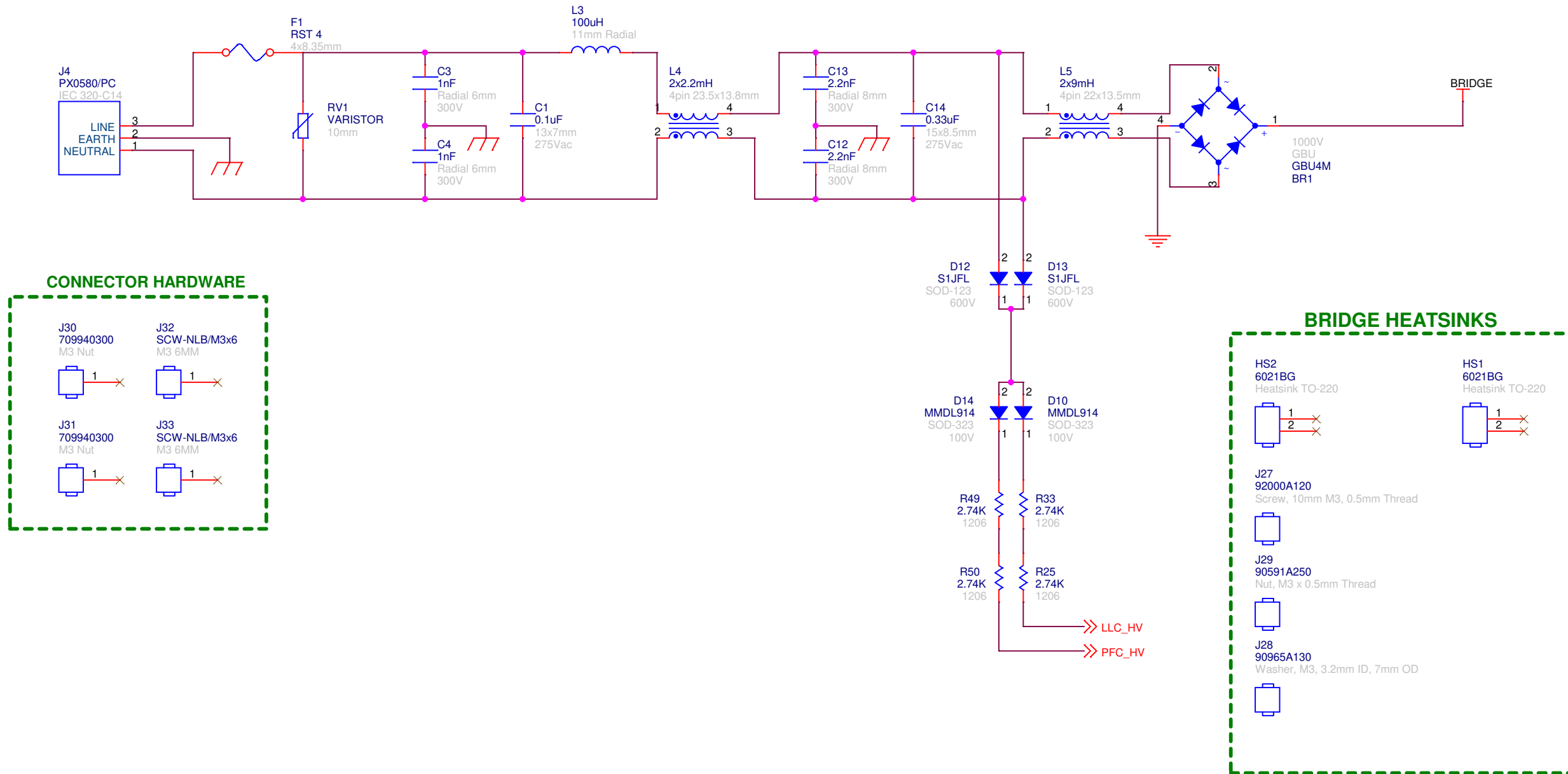
**ON Semiconductor®**  
**200W LLC w/ PFC**

**Comment Legend**

- Description
- Optional
- Not Required

<b>ON Semiconductor</b>		
Title 200W LLC w/ PFC		
Size Custom	Document Number ONSEC-18-022	Rev REV1
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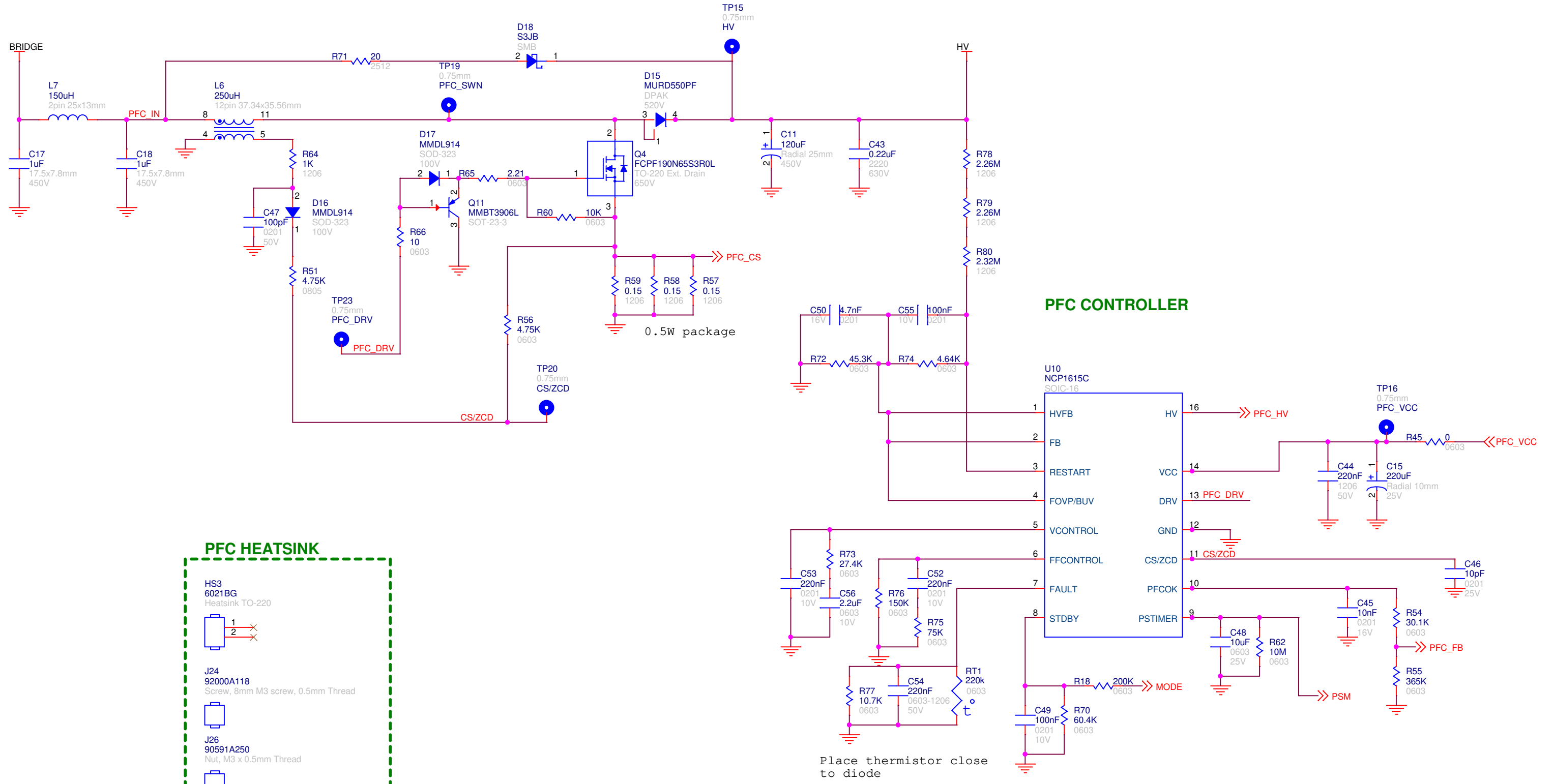
# EMI Filter



**ON Semiconductor**

Title EMI Filter		
Size Custom	Document Number ONSEC-18-022	Rev REV1
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# PFC



## PFC CONTROLLER

## PFC HEATSINK

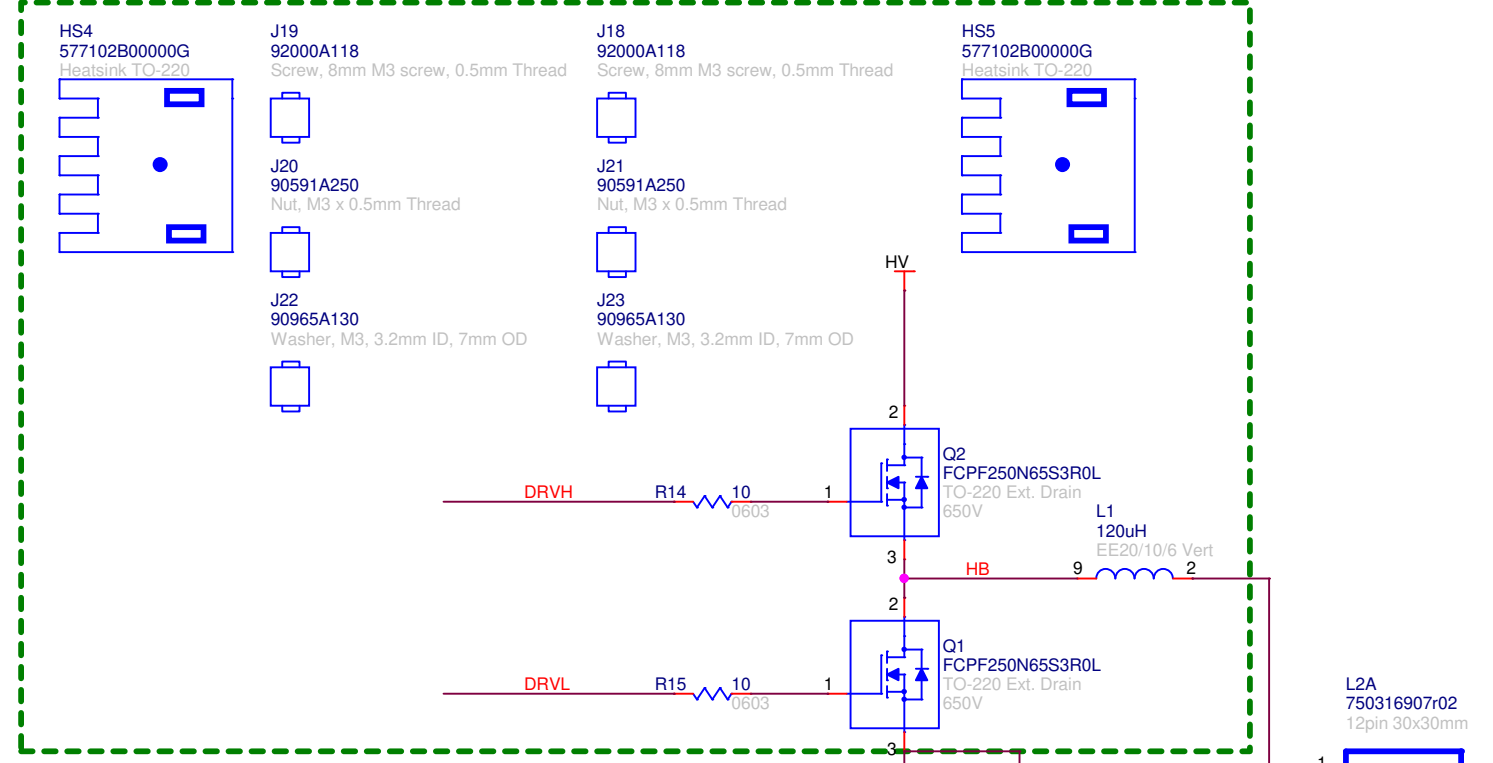
- HS3 6021BG Heatsink TO-220
- J24 92000A118 Screw, 8mm M3 screw, 0.5mm Thread
- J26 90591A250 Nut, M3 x 0.5mm Thread
- J25 90965A130 Washer, M3, 3.2mm ID, 7mm OD

Place thermistor close to diode

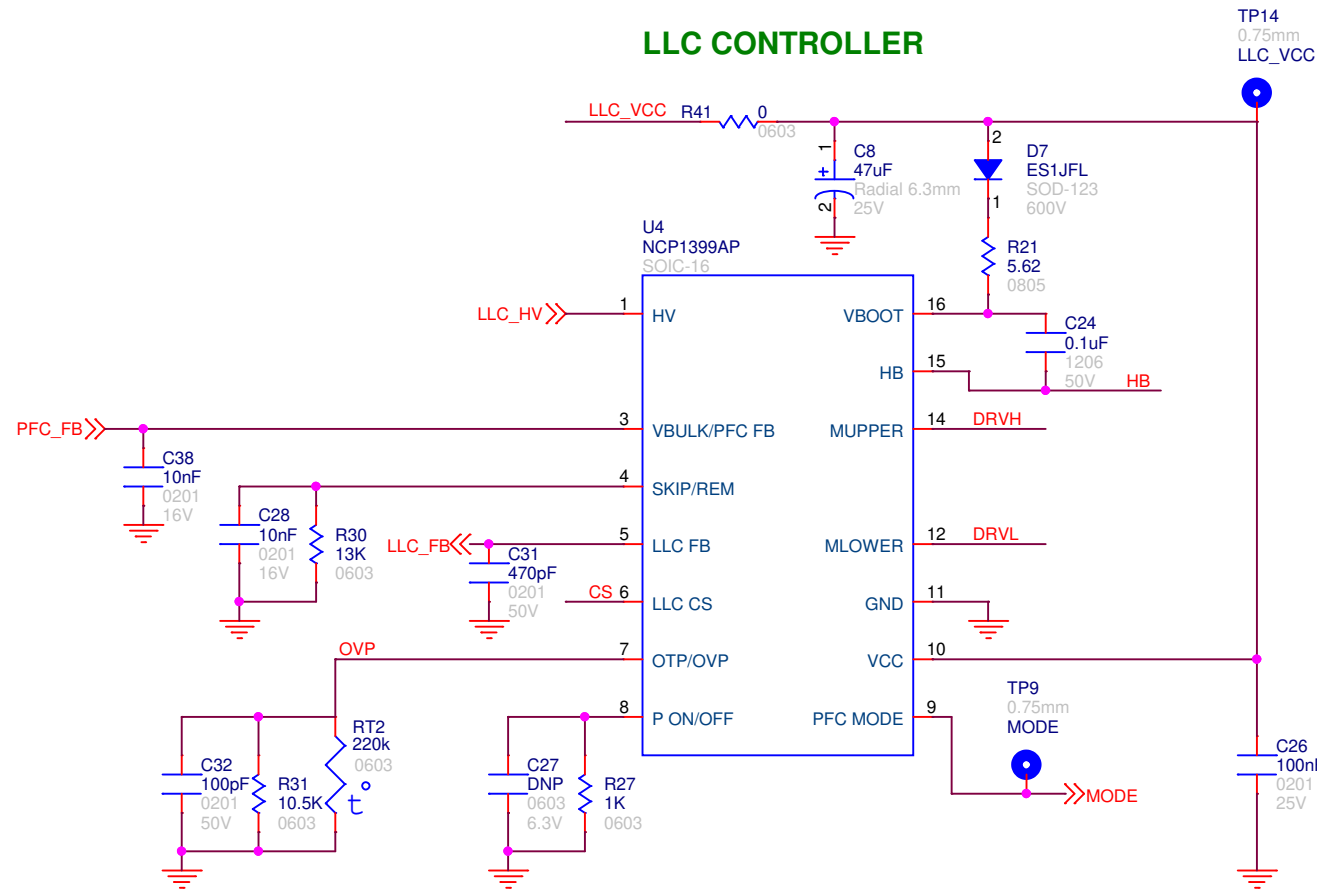
<b>ON Semiconductor</b>		
Title PFC		
Size Custom	Document Number ONSEC-18-022	Rev REV1
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# Primary

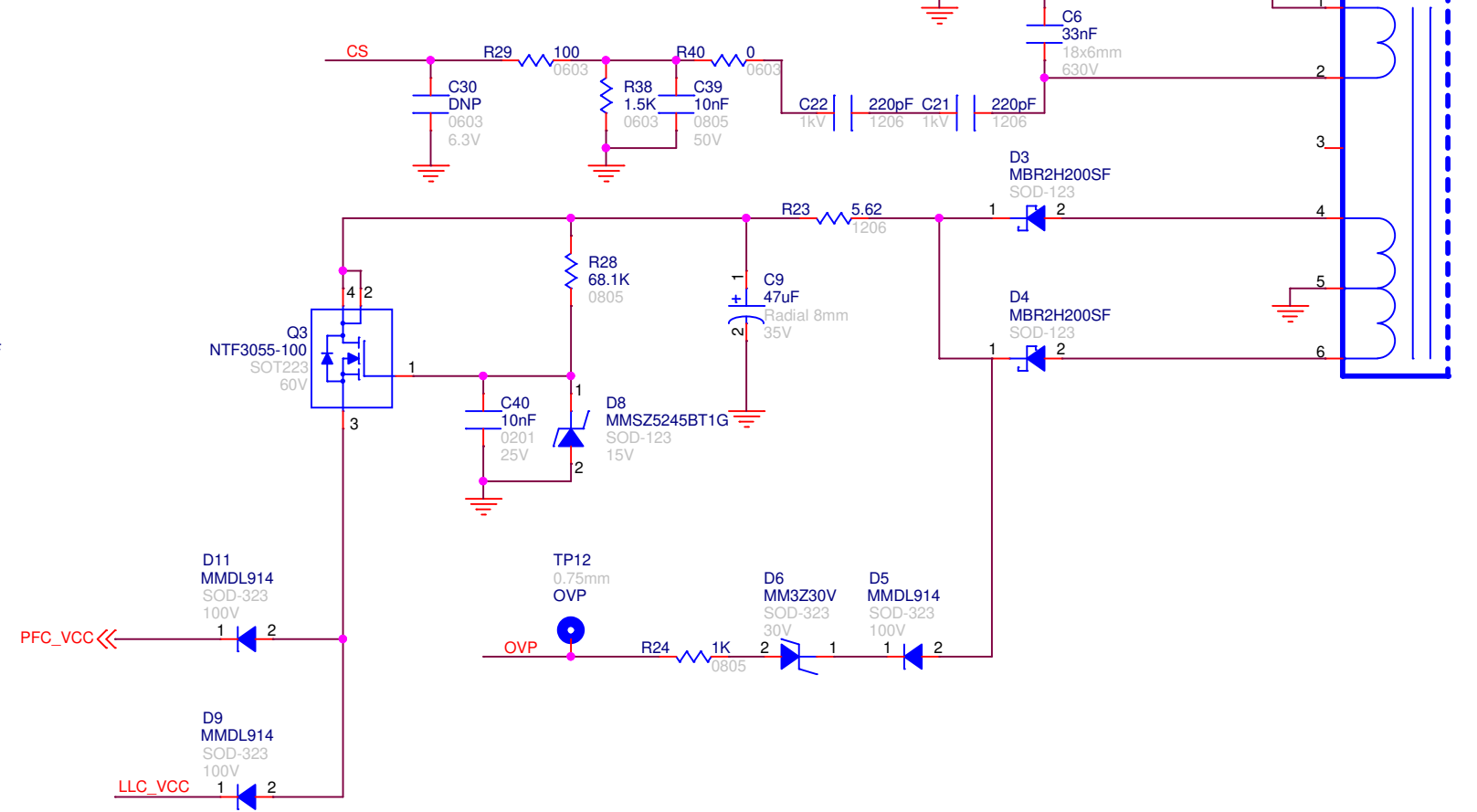
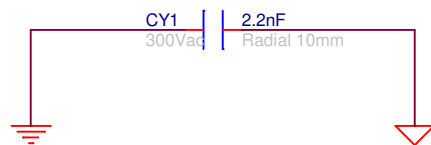
## MOSFET HEATSINKING



## LLC CONTROLLER

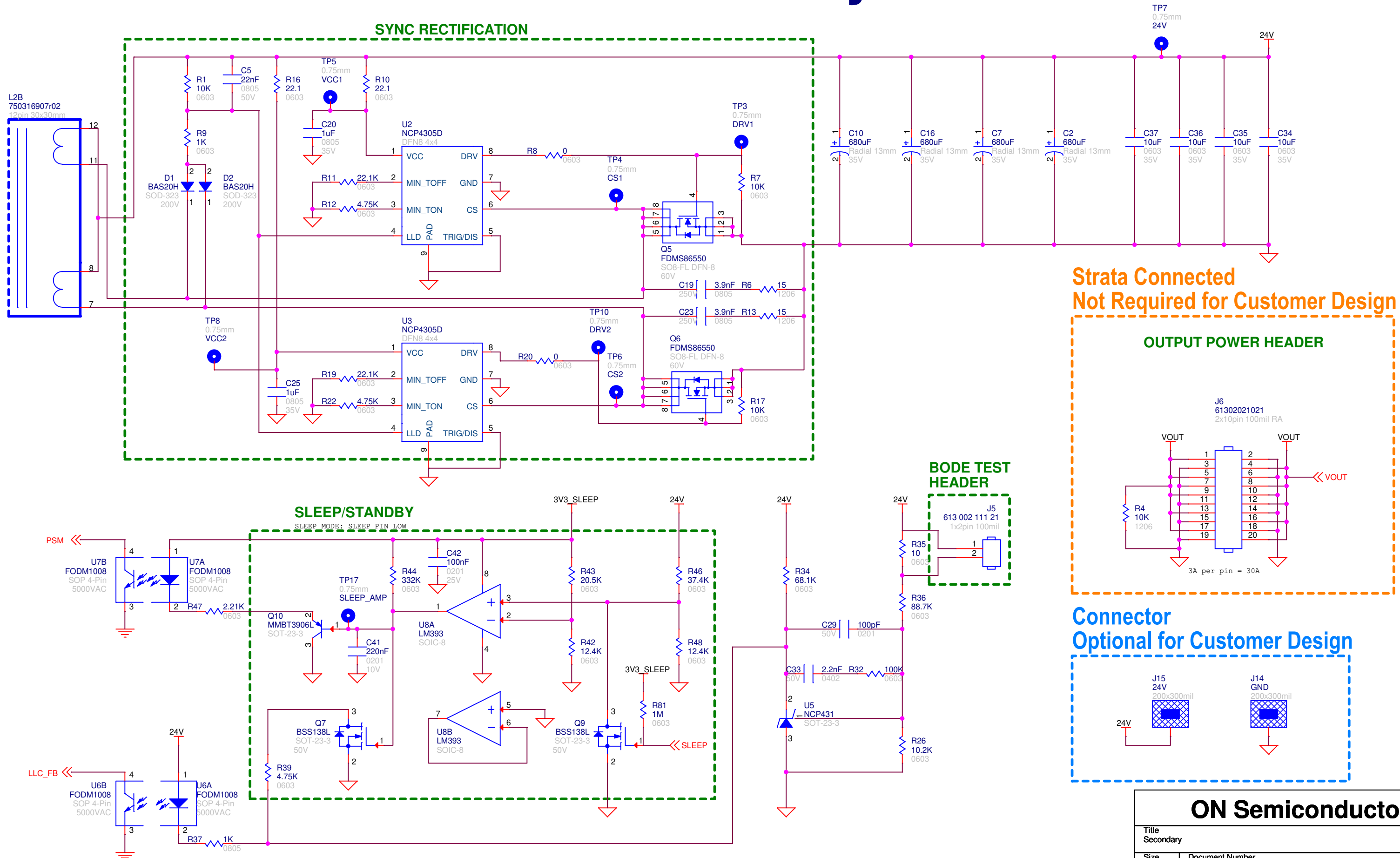


Place thermistor close LLC Inductor

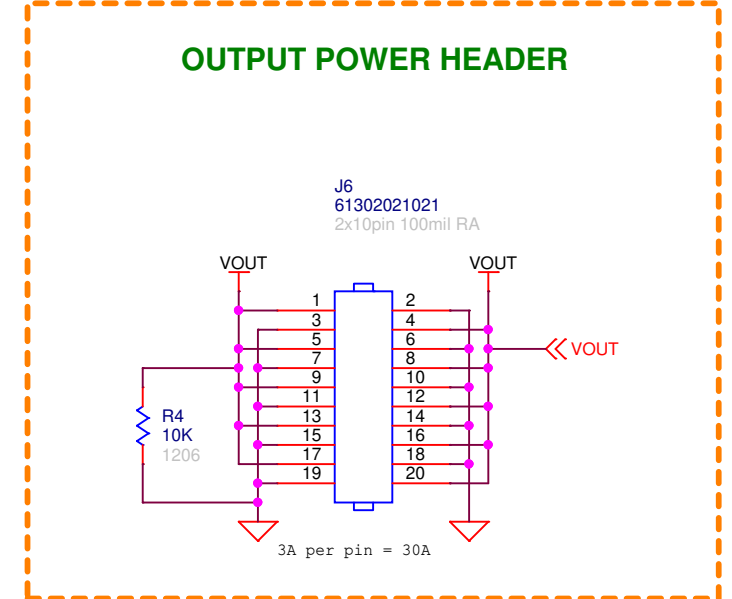


<b>ON Semiconductor</b>		
Title Primary		
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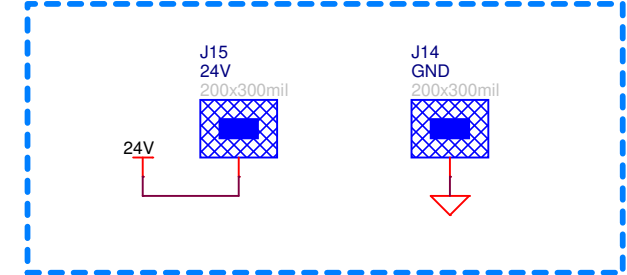
# Secondary



Strata Connected  
Not Required for Customer Design



Connector  
Optional for Customer Design

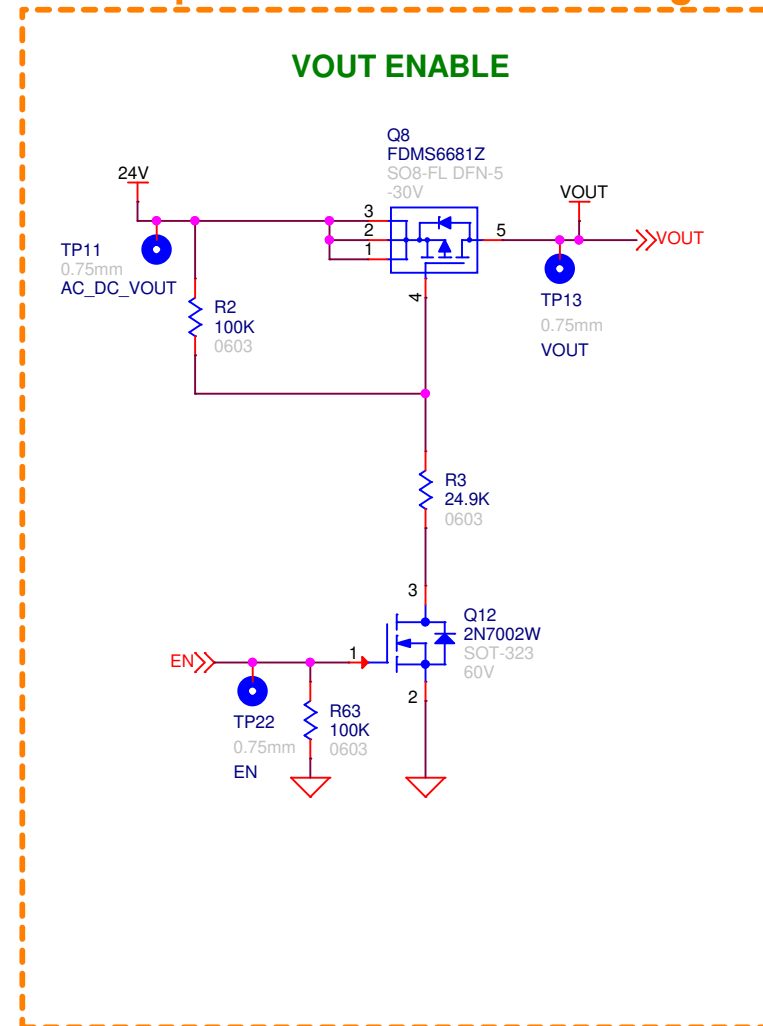


**ON Semiconductor**

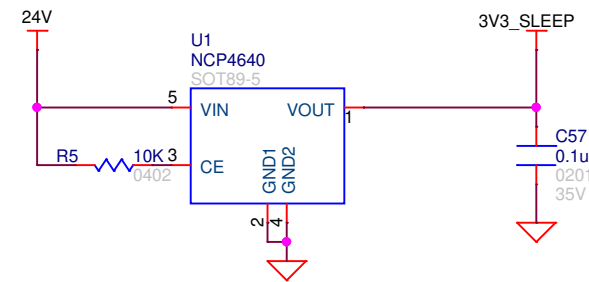
Title Secondary		
Size Custom	Document Number ONSEC-18-022	Rev REV1
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# Test Circuitry

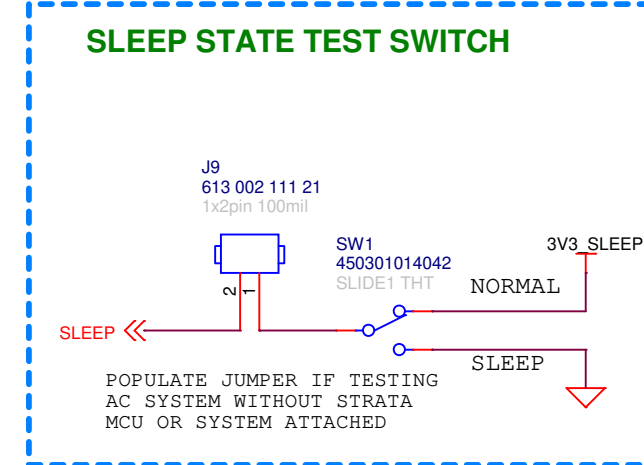
Strata Connected  
Not Required for Customer Design



## SLEEP STATE LDO

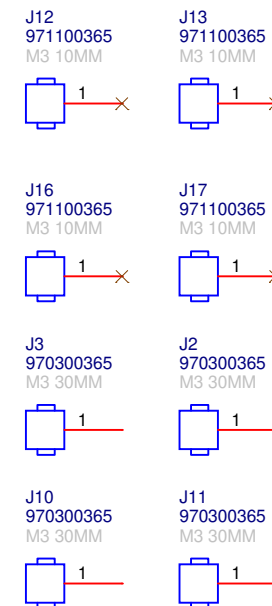


Test Switch  
Optional for Customer Design

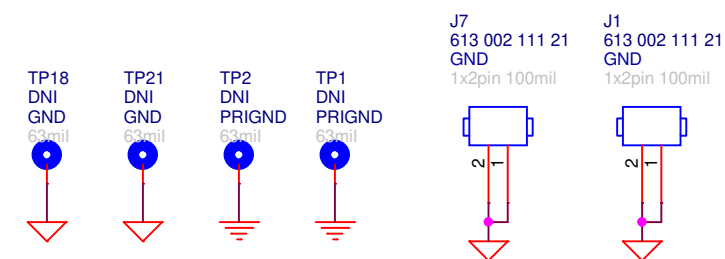


Strata Connected  
Not Required for Customer Design

## MOUNTING HOLES



## GROUND HEADERS



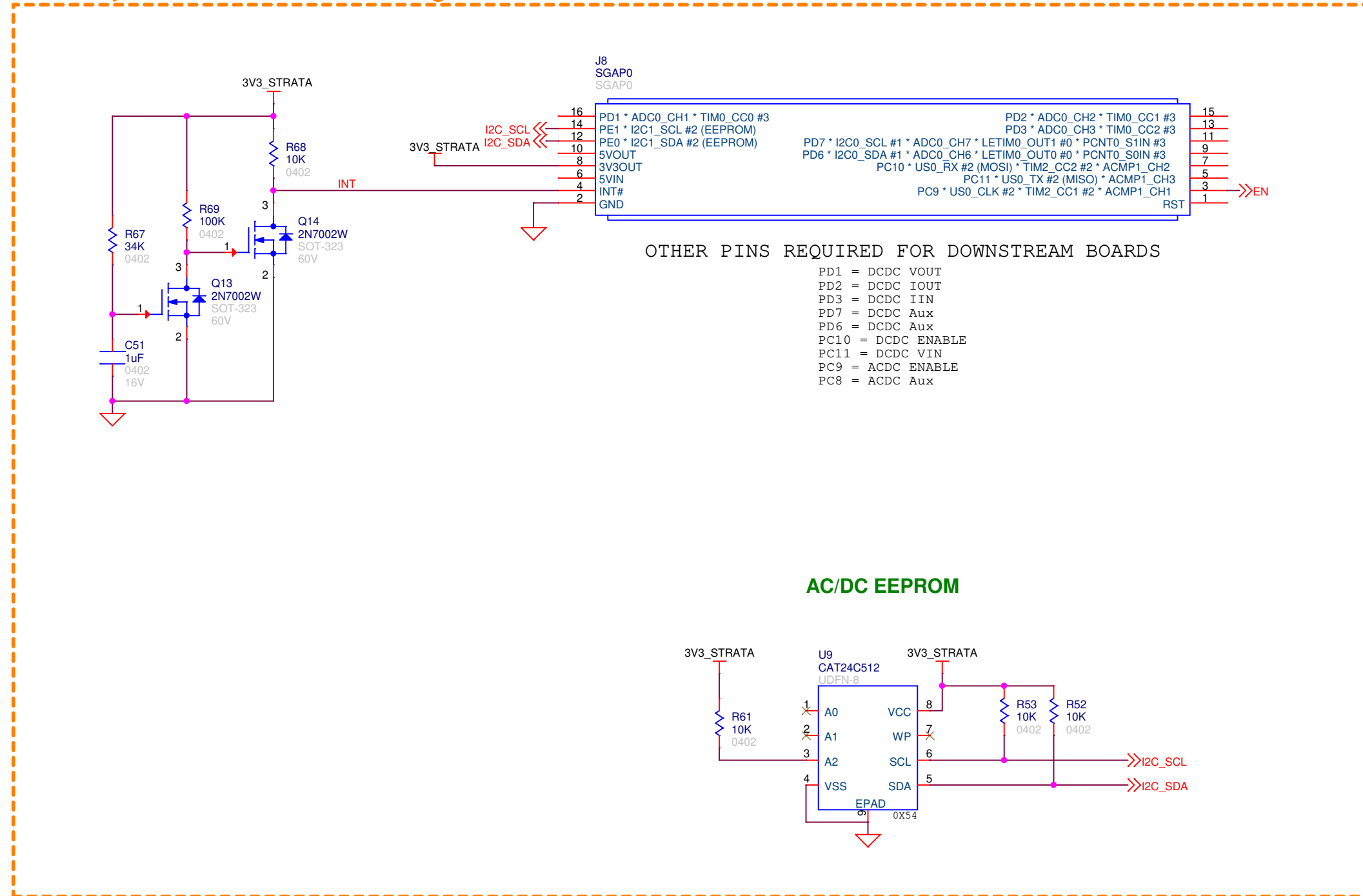
**ON Semiconductor**

Title Test Circuitry		
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# Strata Connection

Strata Connected  
Not Required for Customer Design



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Title Strata Connection		
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