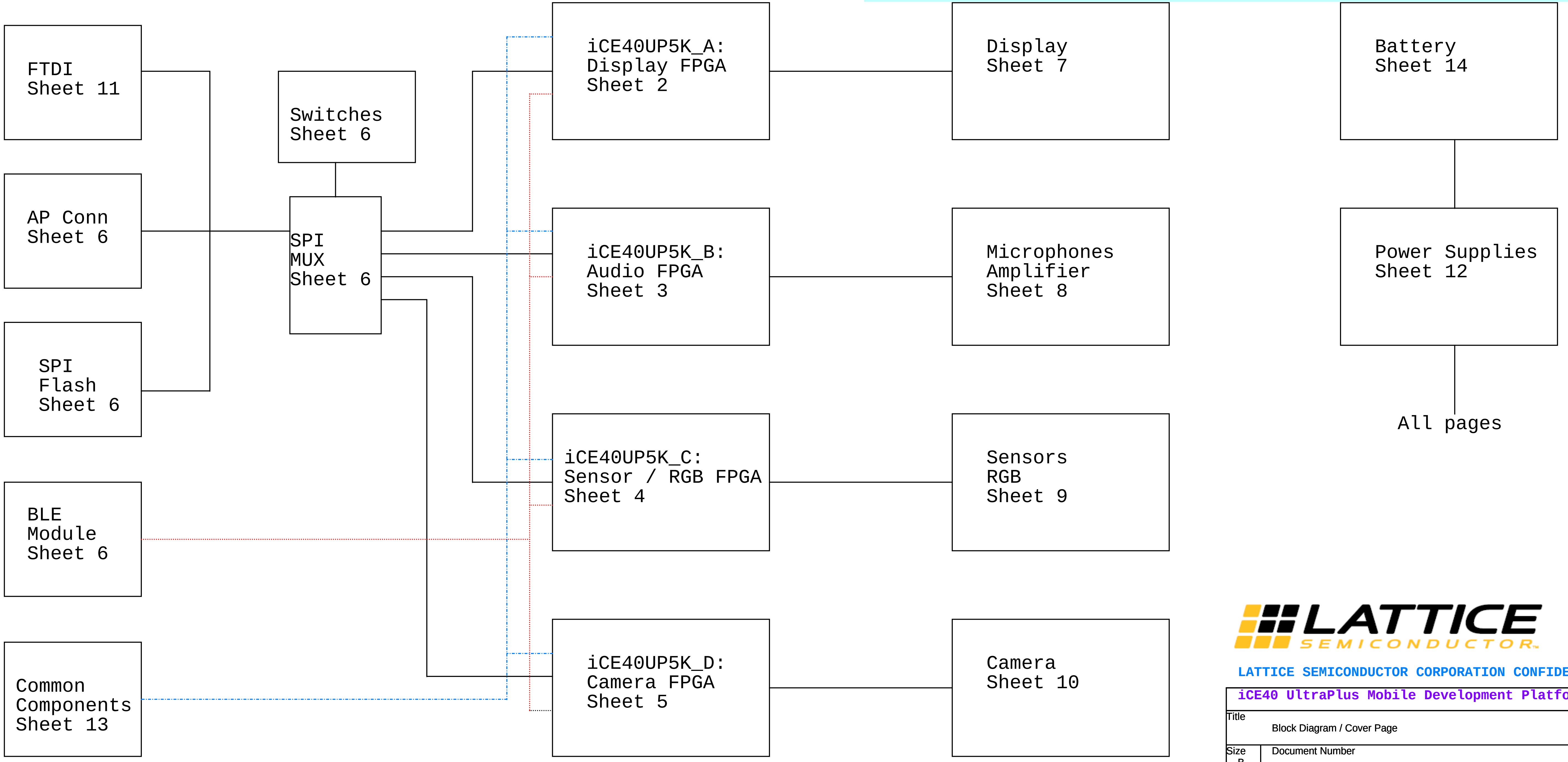
iCE40 UltraPlus Mobile Development Platform
Revision C
August 2 2016

Revision History

Rev A - First Draft

Rev C - Changed Gryroscope i2c address by grounding U36-27
- **Inserted 2 more pins to iCEA control J25 header, pin 7 & 8**
- **Added 4 resistors to allow swap of GLED & BLED on U3 device**
- **Added FT_RESETb on J16.7 - AP INTERCONNECT to allow bypassing of FTDI Chip**
- **Added 2 PDM Microphones**
- **Added ESD protection for J5 USB**
- **Changed D2 - LED2 to GREEN from RED**
- **Changed R42 resistor value to 18ohm from 12ohm**
- **Changed U41 and U42 to DG409LDQ-T1-E3 device**
- **Changed U41 and U42 power to VSUPPLY**



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iCE40 UltraPlus Mobile Development Platform

Title: Block Diagram / Cover Page
Size: B
Document Number:
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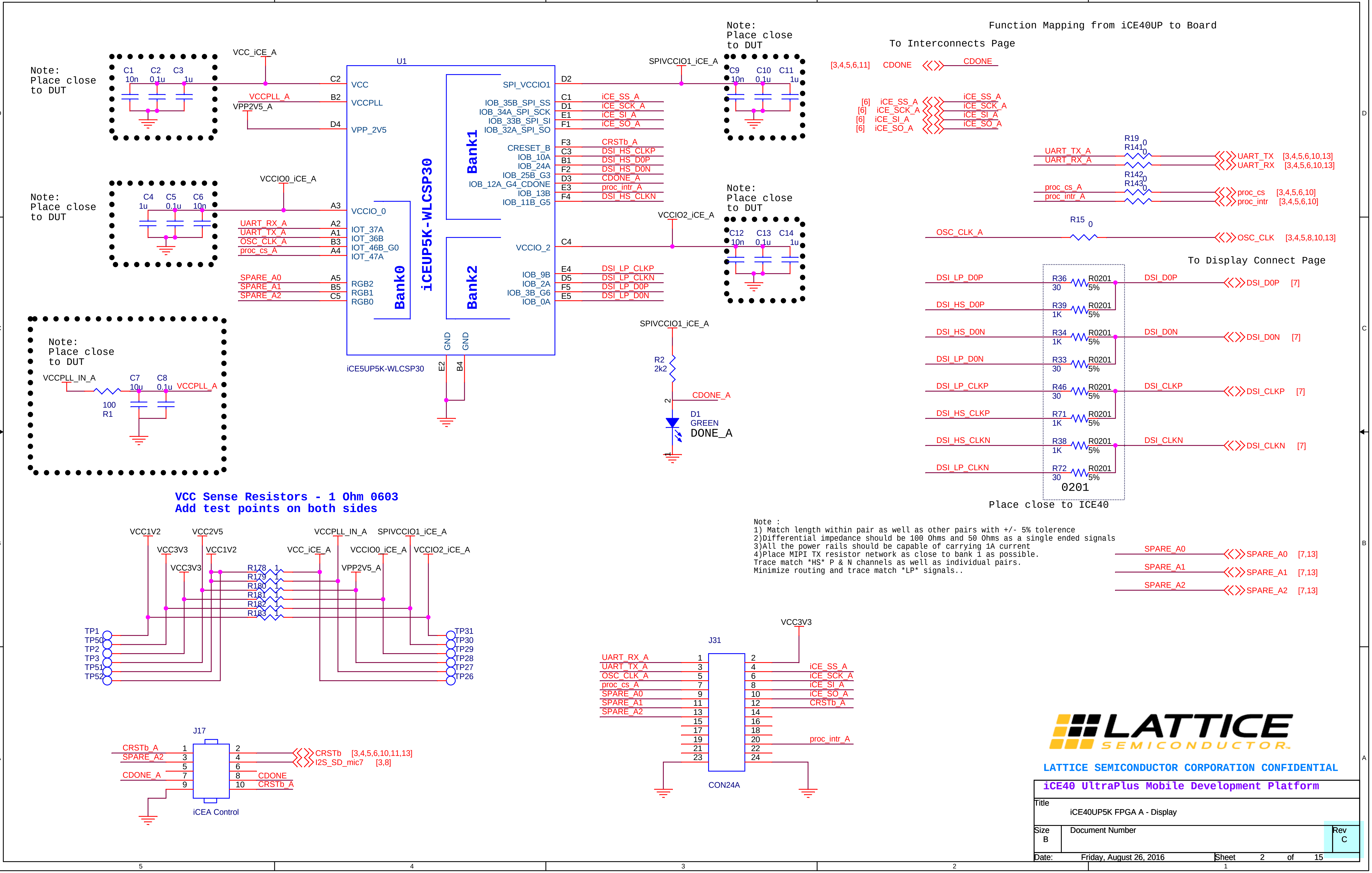

Note :
1) Match length within pair as well as other pairs with +/- 5% tolerence
2)Differential impedance should be 100 Ohms and 50 Ohms as a single ended signals
3)All the power rails should be capable of carrying 1A current
4)Place MIPI TX resistor network as close to bank 1 as possible.
Trace match *HS* P & N channels as well as individual pairs.
Minimize routing and trace match *LP* signals..

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iCE40 UltraPlus Mobile Development Platform

Title	iCE40UP5K FPGA A - Display	
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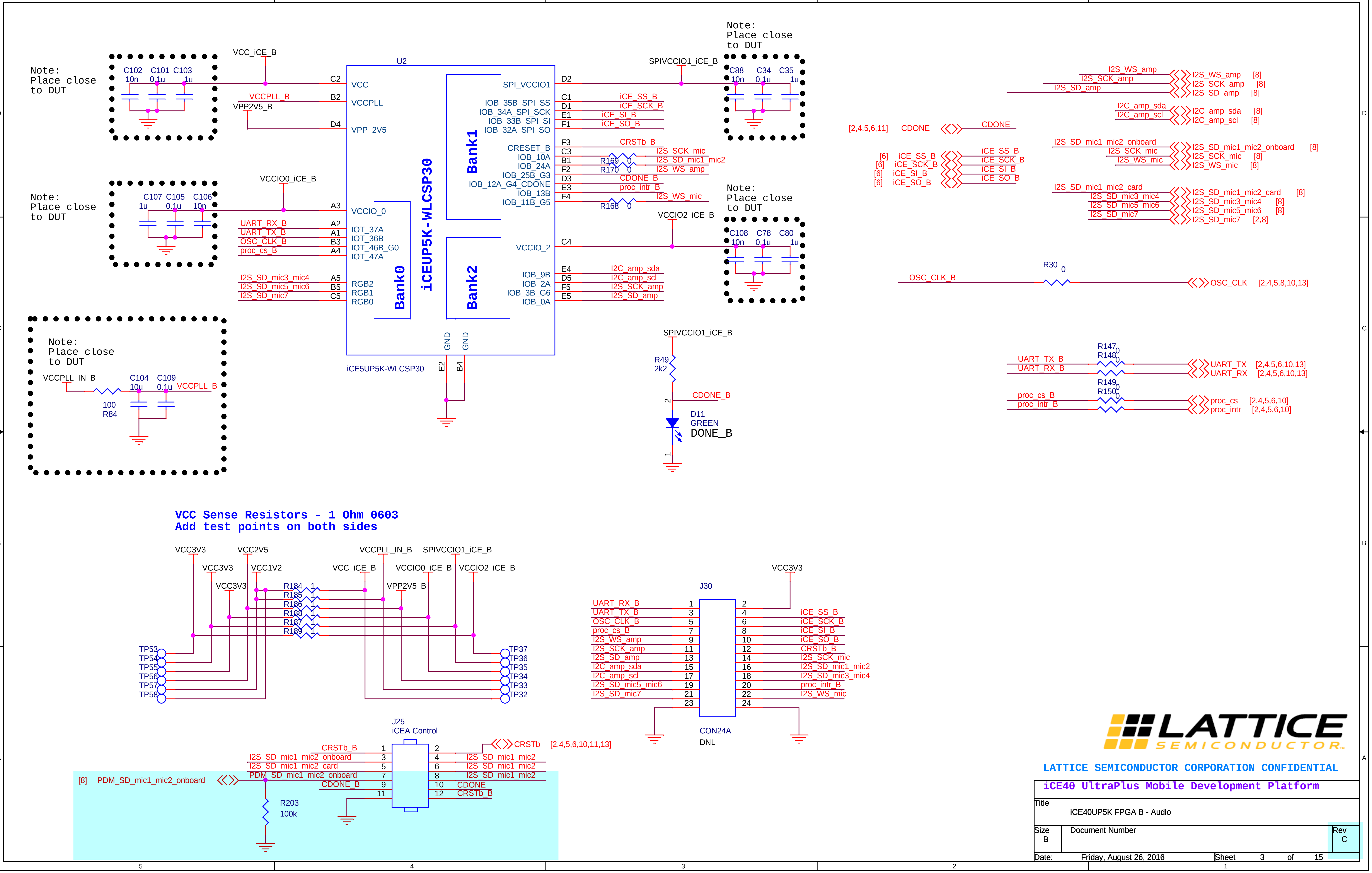

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Title	iCE40UP5K FPGA B - Audio	
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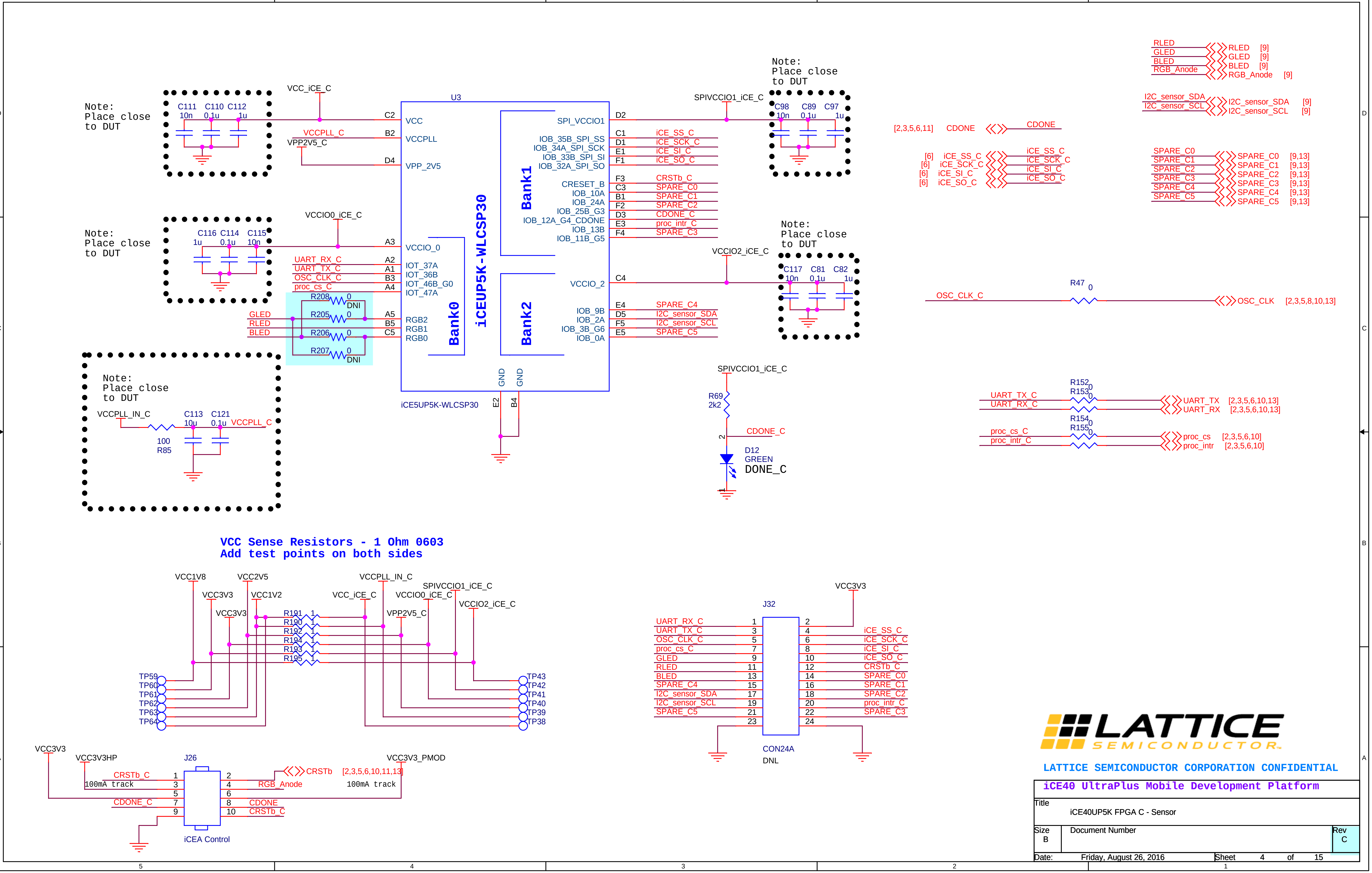

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Title	iCE40UP5K FPGA C - Sensor	
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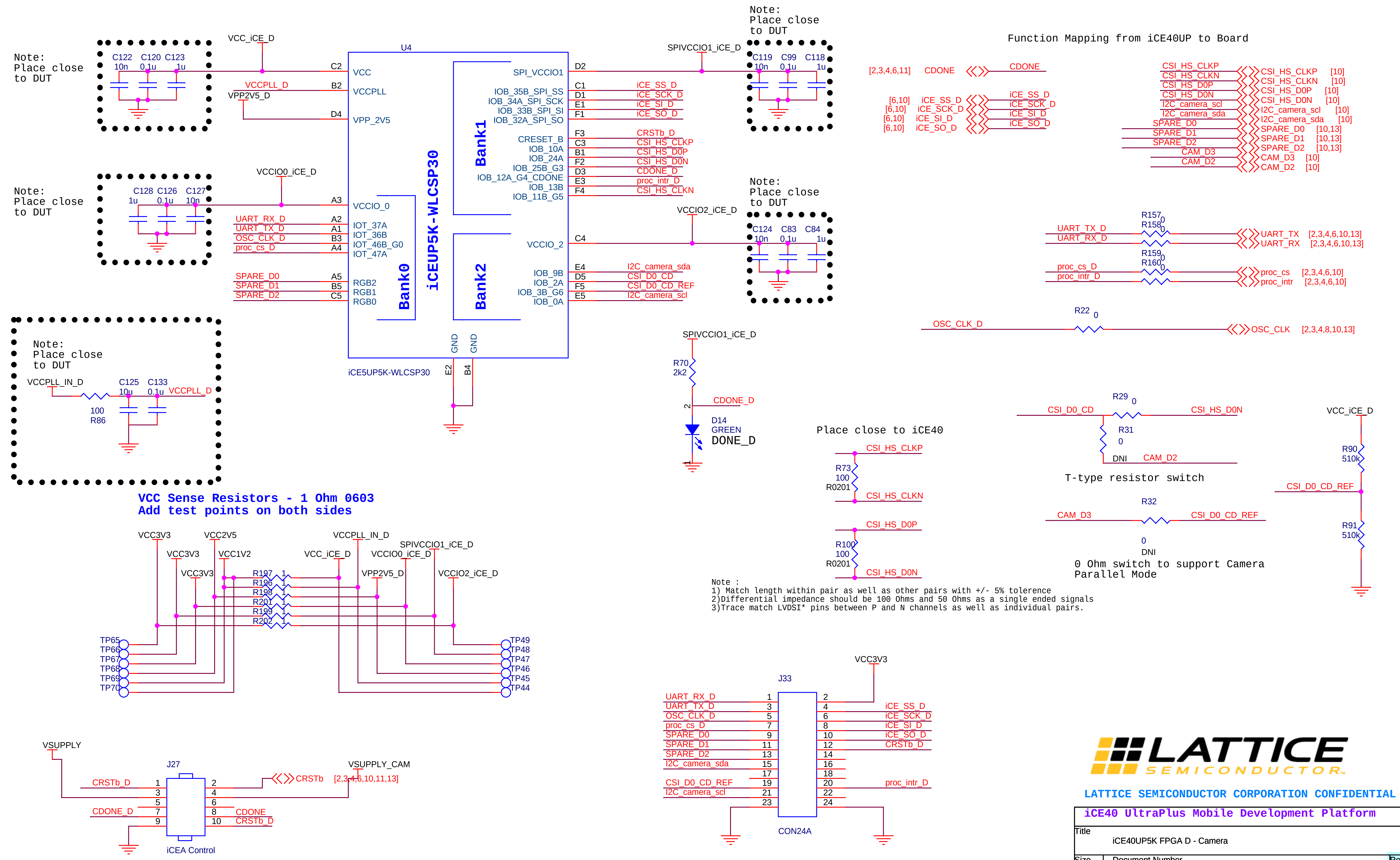

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Title	iCE40UP5K FPGA D - Camera
Size B	Document Number
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Date:	Friday, August 26, 2016
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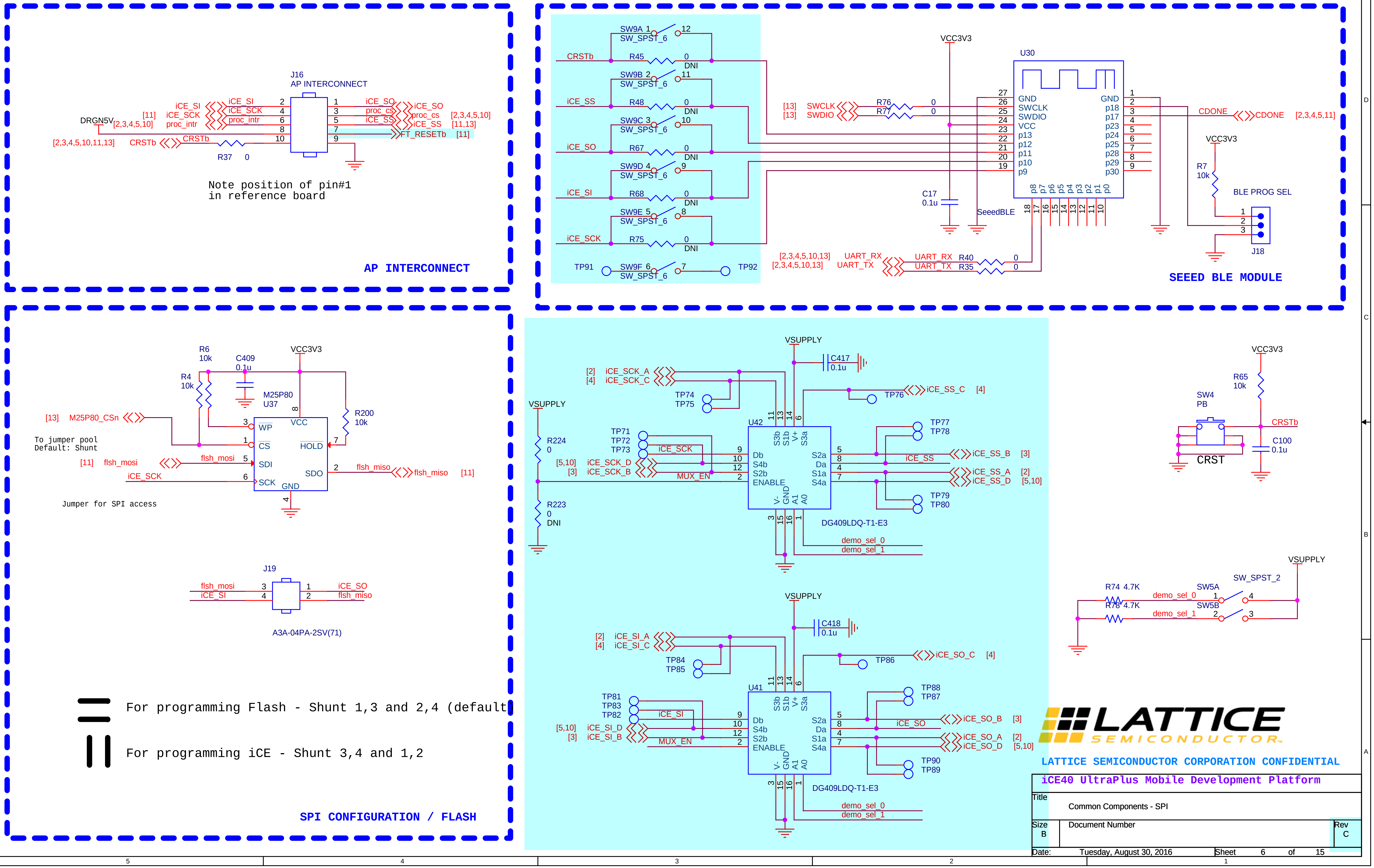

Note position of pin#1
in reference board

To jumper pool
Default: Shunt

Jumper for SPI access

For programming Flash - Shunt 1,3 and 2,4 (default)

For programming iCE - Shunt 3,4 and 1,2

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iCE40 UltraPlus Mobile Development Platform

Title	Common Components - SPI	
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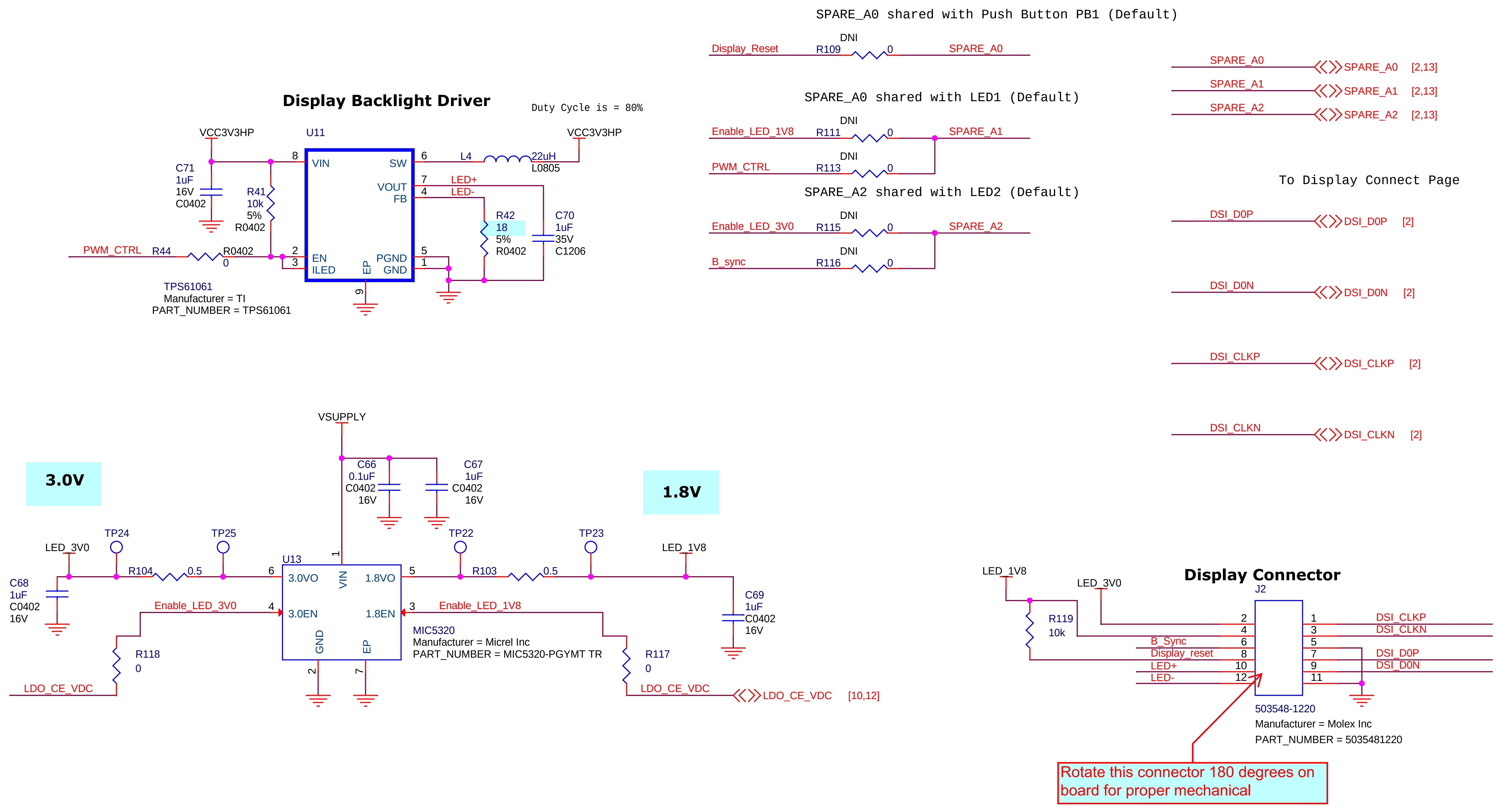

Rotate this connector 180 degrees on board for proper mechanical

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iCE40 UltraPlus Mobile Development Platform

Title
Display Circuitry

Size	Document Number	Rev
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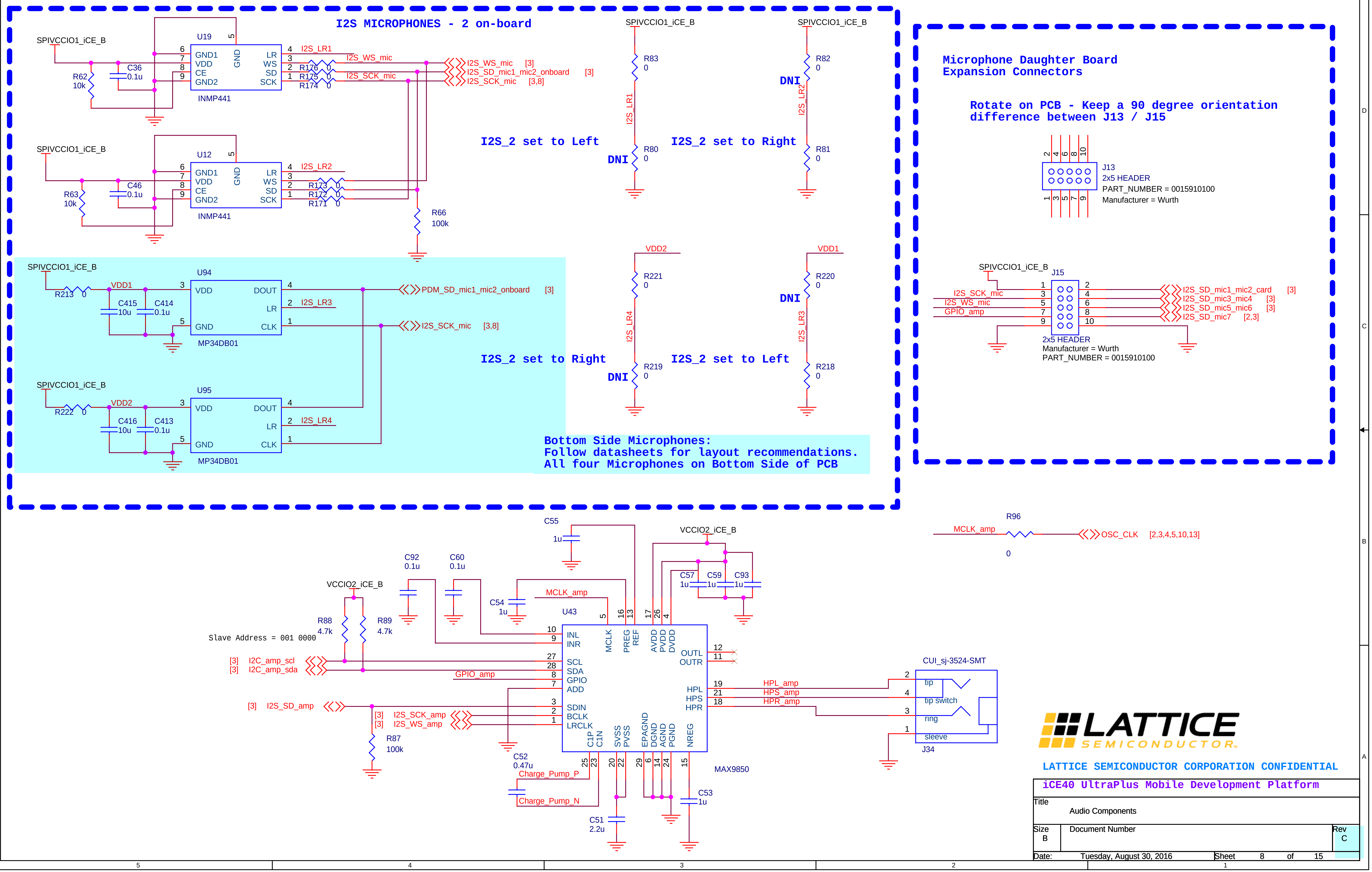

I2S MICROPHONES - 2 on-board

I2S_2 set to Left

I2S_2 set to Right

I2S_2 set to Right

I2S_2 set to Left

Bottom Side Microphones:
Follow datasheets for layout recommendations.
All four Microphones on Bottom Side of PCB

Microphone Daughter Board
Expansion Connectors

Rotate on PCB - Keep a 90 degree orientation
difference between J13 / J15

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iCE40 UltraPlus Mobile Development Platform

Title
Audio Components

Size	Document Number	Rev
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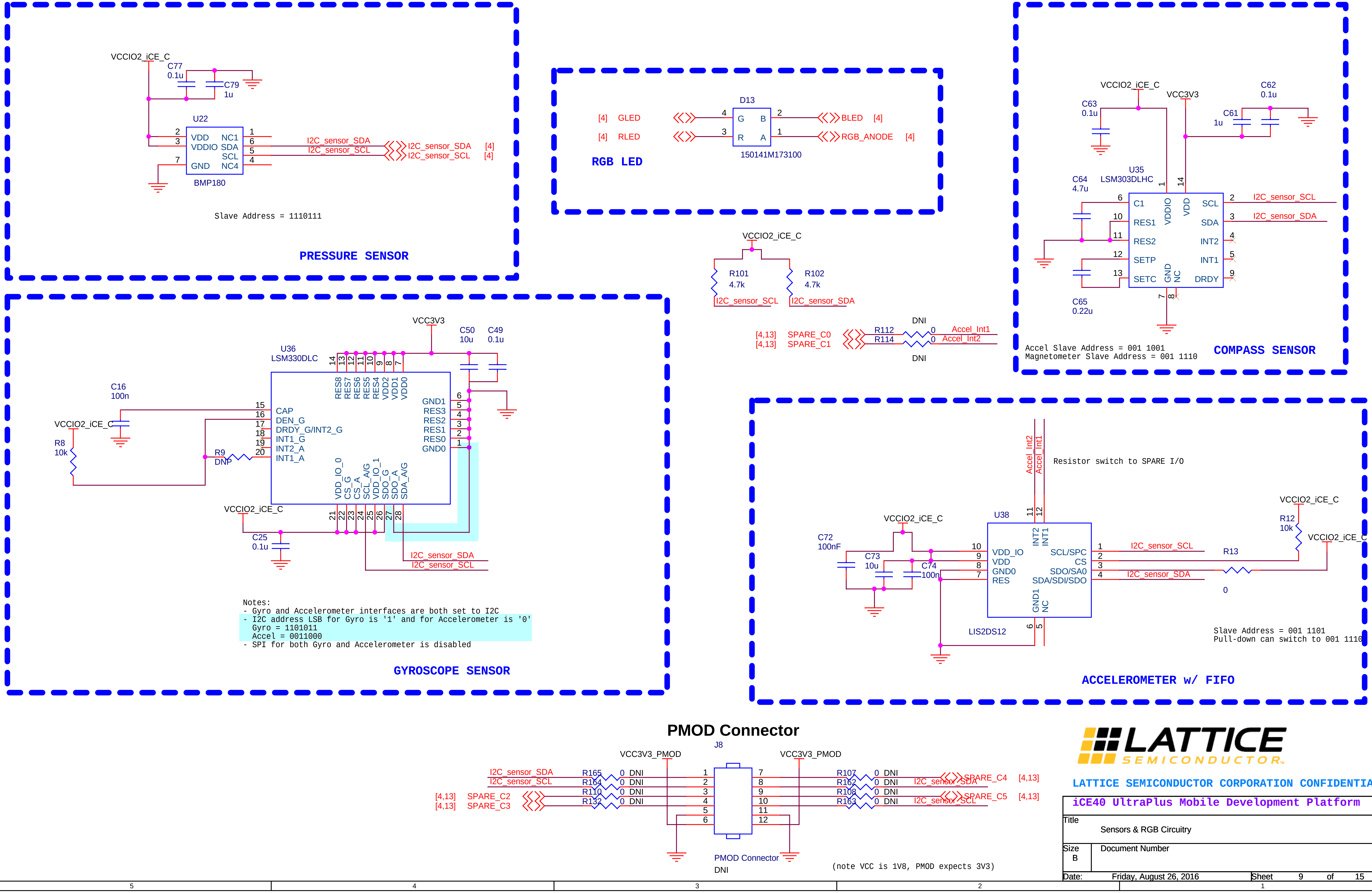

```
Slave Address = 1110111
```

```
Accel Slave Address = 001 1001
Magnetometer Slave Address = 001 1110
```

```
Notes:
- Gyro and Accelerometer interfaces are both set to I2C
- I2C address LSB for Gyro is '1' and for Accelerometer is '0'
  Gyro = 1101011
  Accel = 0011000
- SPI for both Gyro and Accelerometer is disabled
```

```
Slave Address = 001 1101
Pull-down can switch to 001 1110
```

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Title Sensors & RGB Circuitry			
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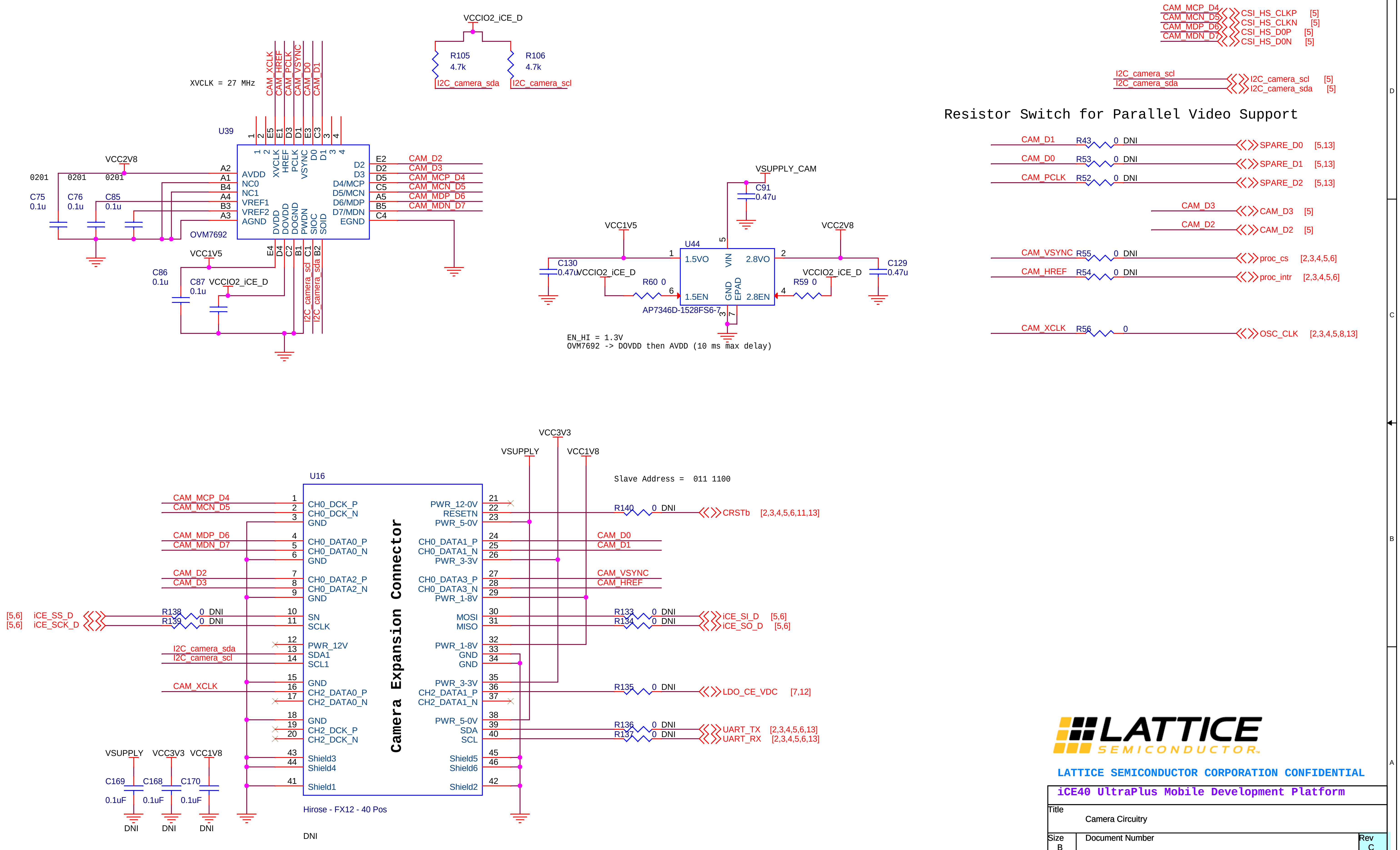

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iCE40 UltraPlus Mobile Development Platform

Title	Camera Circuitry	
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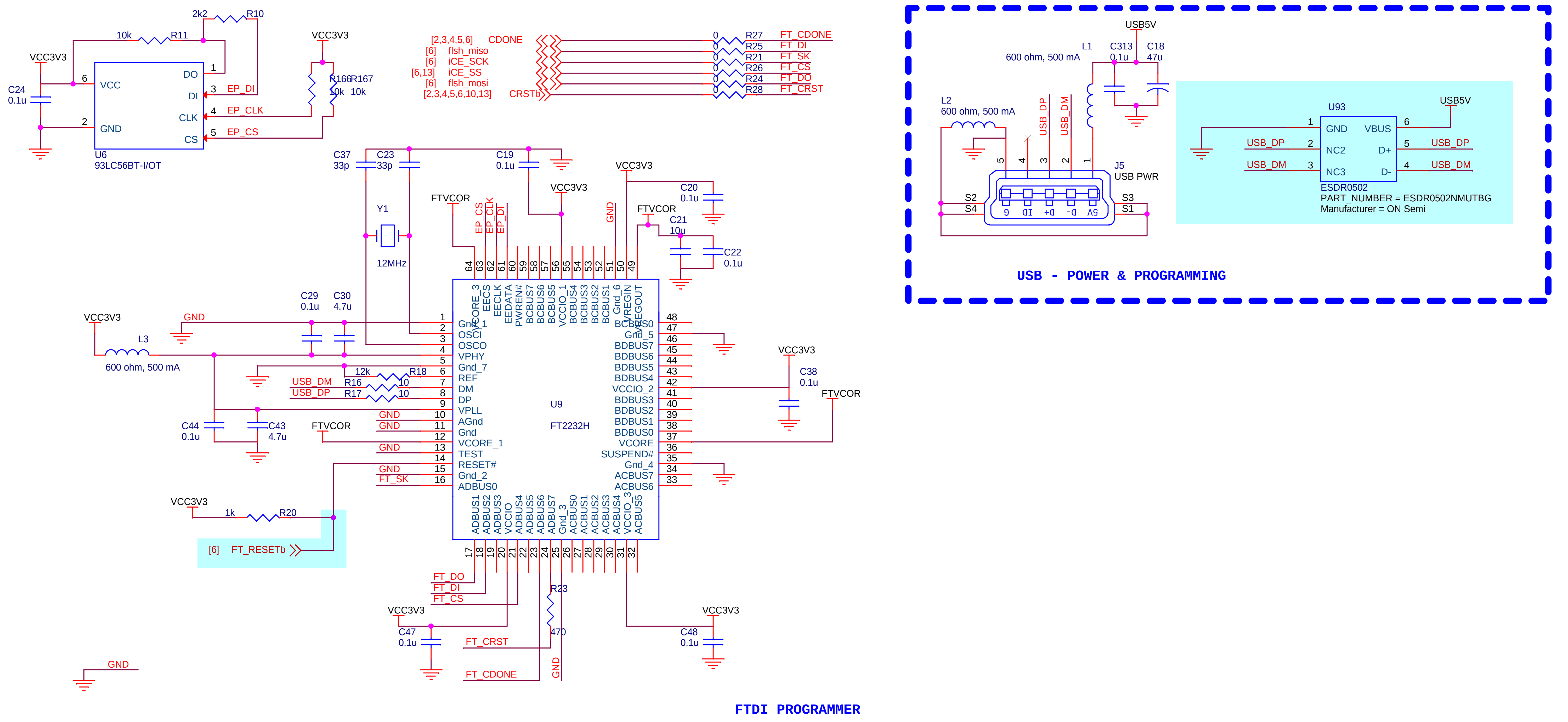

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iCE40 UltraPlus Mobile Development Platform

Title USB Programming		
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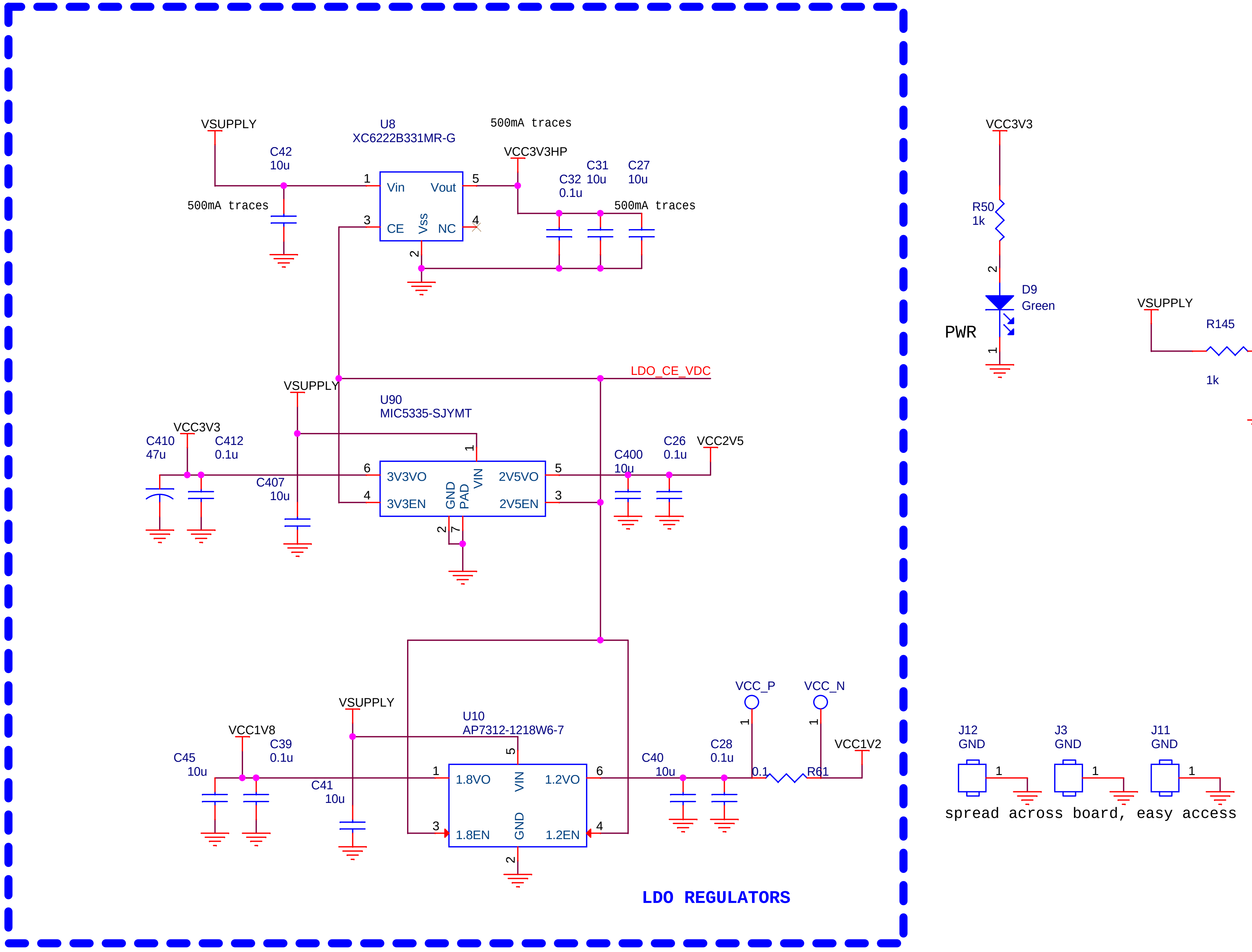

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iCE40 UltraPlus Mobile Development Platform		
Title Power Supplies		
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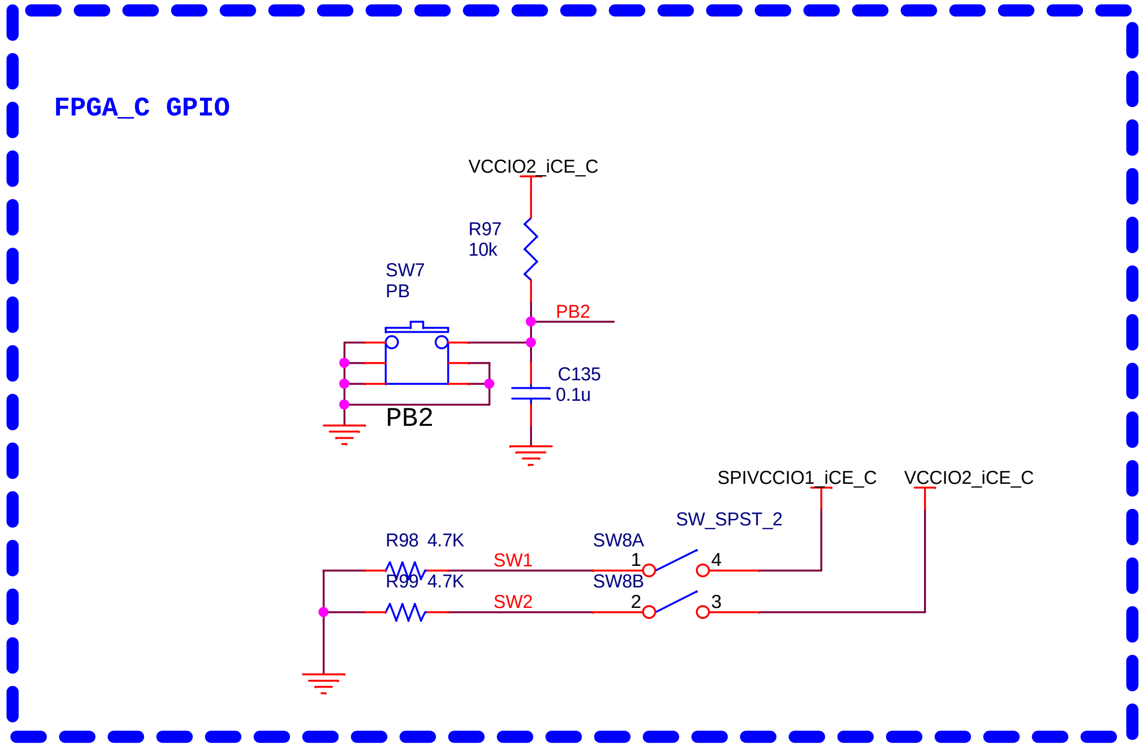
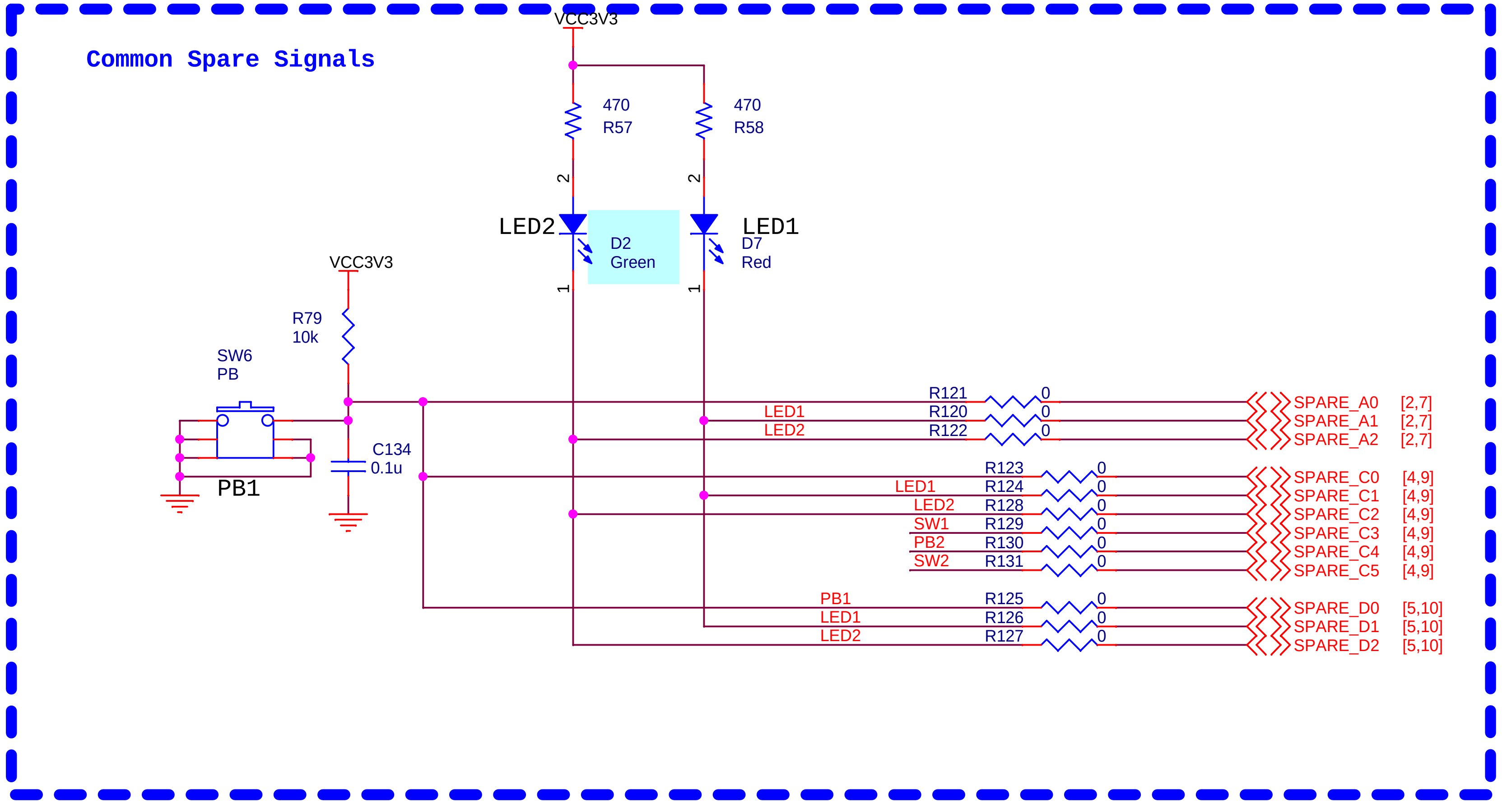
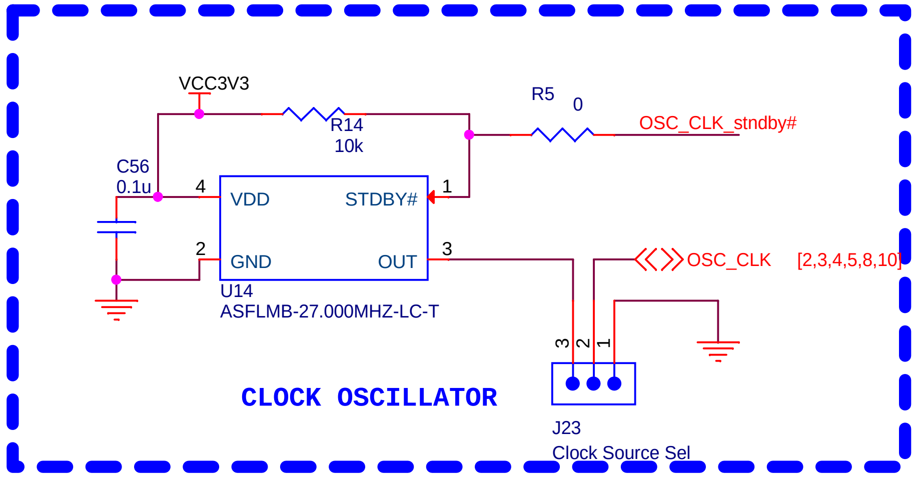
SPARE_A0 shared with Display Controls (PB is default)
SPARE_A1 shared with Display Controls (LED is default)
SPARE_A2 shared with Display Controls (LED is default)

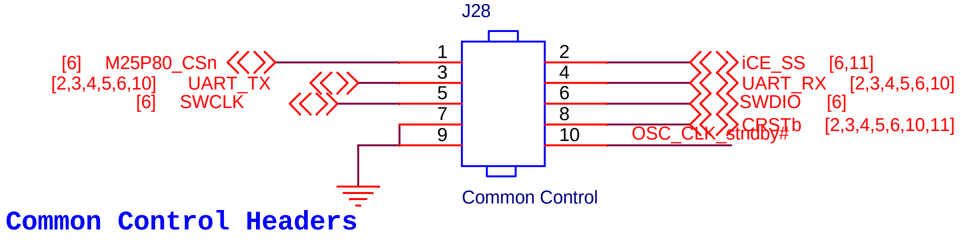
SPARE_C0 shared with Accel interrupt1 (PB is default)
SPARE_C1 shared with Accel interrupt2 (SW is default)
SPARE_C2 shared with PMOD (PB is default)
SPARE_C0 shared with PMOD (SW is default)
SPARE_C0 shared with PMOD (LED is default)
SPARE_C0 shared with PMOD (LED is default)

SPARE_D0 shared with Camera Parallel Interface (PB is default)
SPARE_D1 shared with Camera Parallel Interfaces (LED is default)
SPARE_D2 shared with Camera Parallel Interface (LED is default)









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Title	Common Components	
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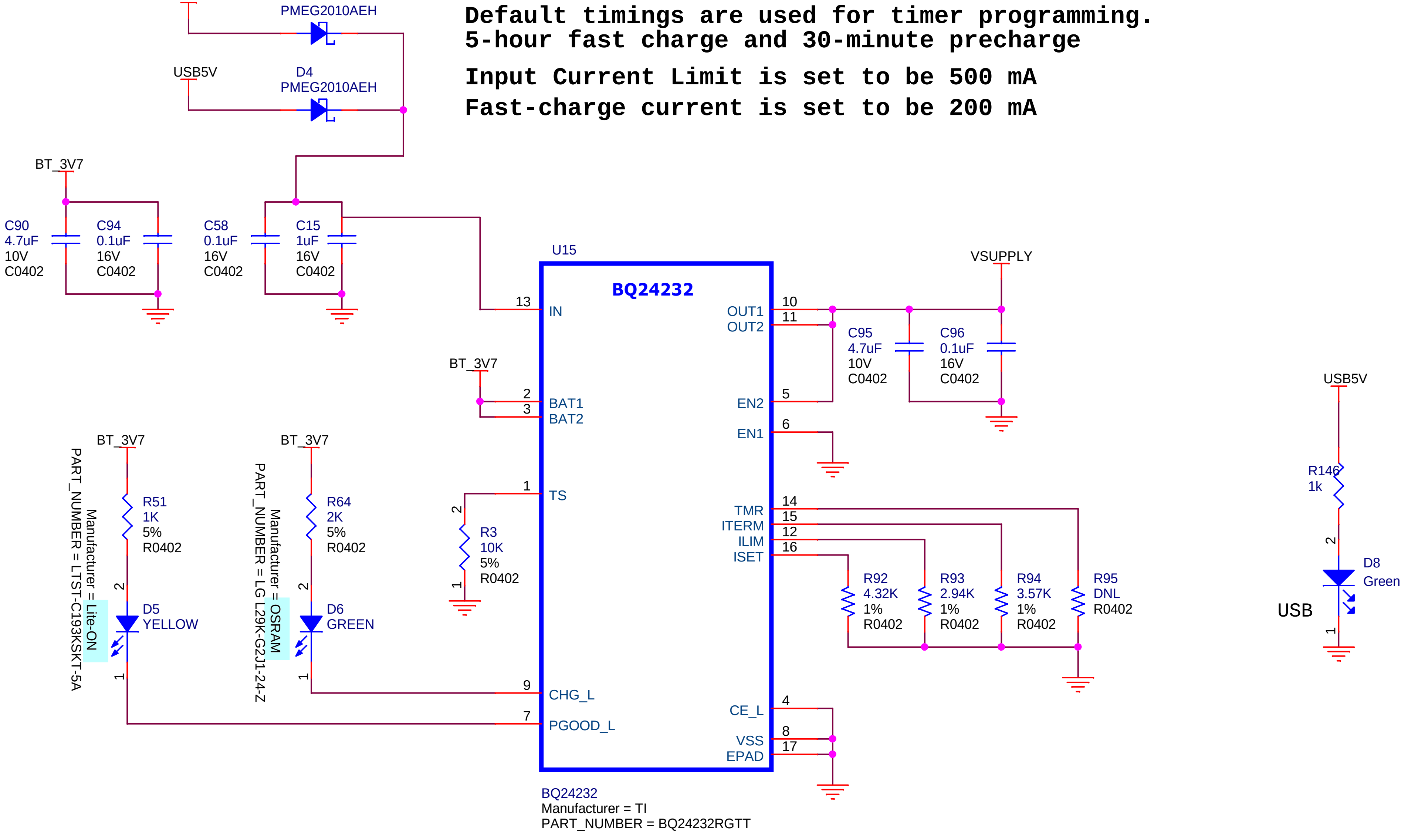
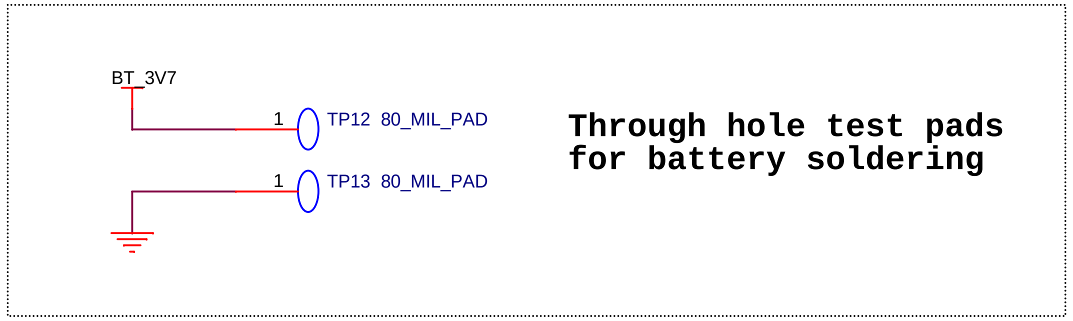
Iterm is set to be 25 mA.
Default timings are used for timer programming.
5-hour fast charge and 30-minute precharge
Input Current Limit is set to be 500 mA
Fast-charge current is set to be 200 mA





Through hole test pads for battery soldering

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iCE40 UltraPlus Mobile Development Platform

Title
Battery Connector & Charger

Size B
Document Number
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