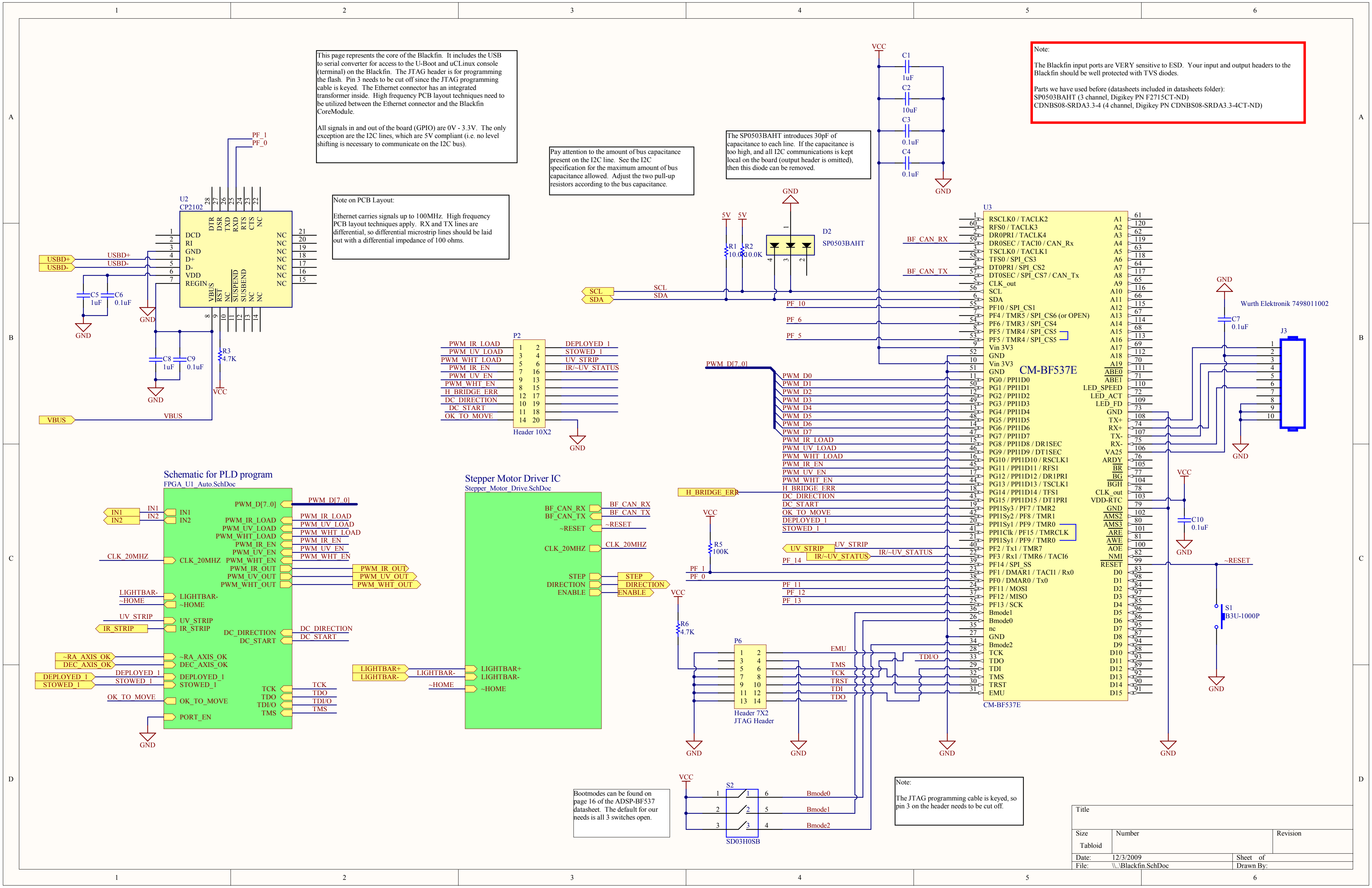


This page represents the core of the Blackfin. It includes the USB to serial converter for access to the U-Boot and uCLinux console (terminal) on the Blackfin. The JTAG header is for programming the flash. Pin 3 needs to be cut off since the JTAG programming cable is keyed. The Ethernet connector has an integrated transformer inside. High frequency PCB layout techniques need to be utilized between the Ethernet connector and the Blackfin CoreModule.

All signals in and out of the board (GPIO) are 0V - 3.3V. The only exception are the I2C lines, which are 5V compliant (i.e. no level shifting is necessary to communicate on the I2C bus).

Note on PCB Layout:

Ethernet carries signals up to 100MHz. High frequency PCB layout techniques apply. RX and TX lines are differential, so differential microstrip lines should be laid out with a differential impedance of 100 ohms.

Pay attention to the amount of bus capacitance present on the I2C line. See the I2C specification for the maximum amount of bus capacitance allowed. Adjust the two pull-up resistors according to the bus capacitance.

The SP0503BAHT introduces 30pF of capacitance to each line. If the capacitance is too high, and all I2C communications is kept local on the board (output header is omitted), then this diode can be removed.

Note:

The Blackfin input ports are VERY sensitive to ESD. Your input and output headers to the Blackfin should be well protected with TVS diodes.

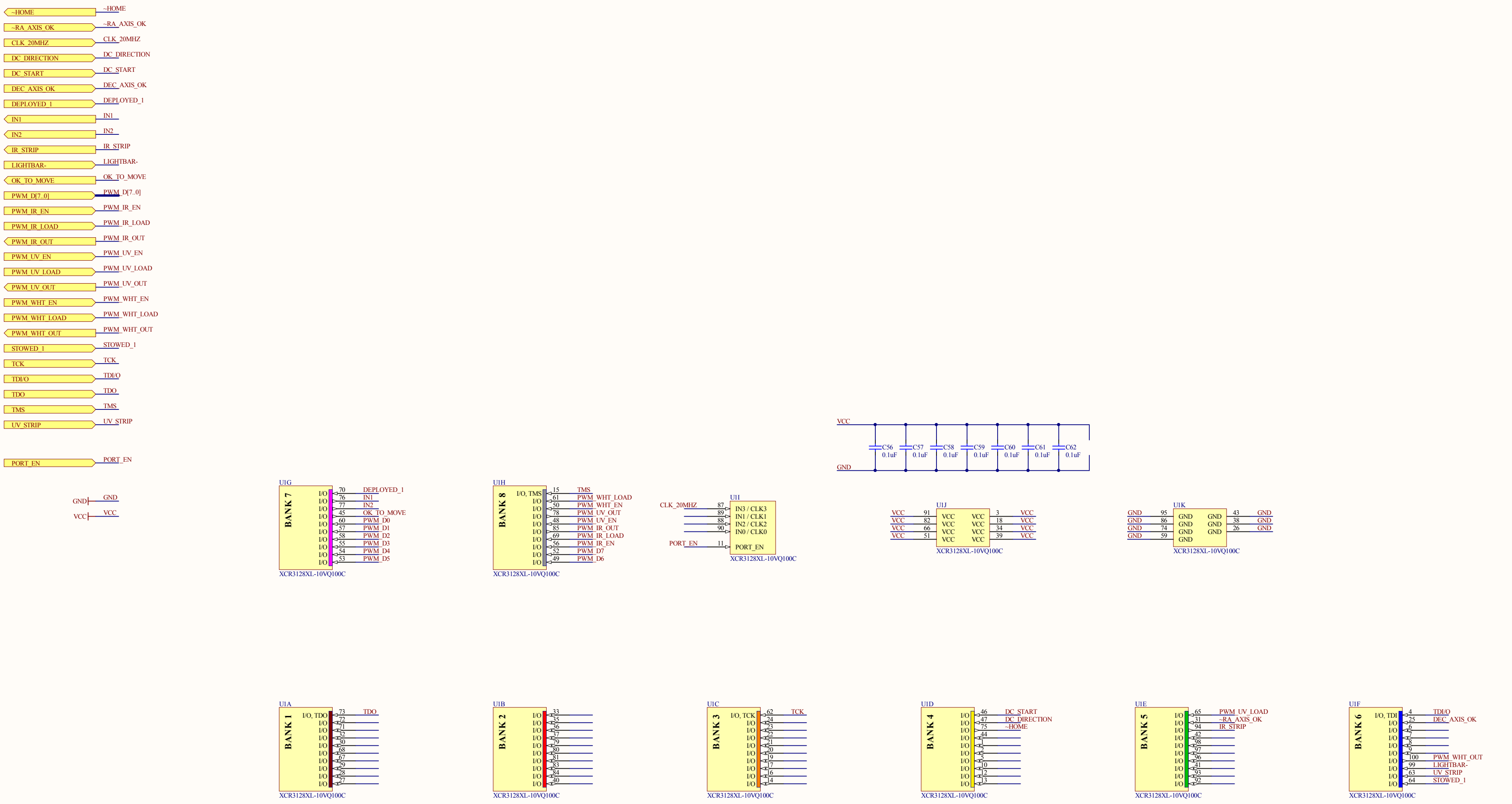
Parts we have used before (datasheets included in datasheets folder):
SP0503BAHT (3 channel, Digikey PN F2715CT-ND)
CDNBS08-SRDA3.3-4 (4 channel, Digikey PN CDNBS08-SRDA3.3-4CT-ND)

Bootmodes can be found on page 16 of the ADSP-BF537 datasheet. The default for our needs is all 3 switches open.

Note:

The JTAG programming cable is keyed, so pin 3 on the header needs to be cut off.

Title		
Size Tabloid	Number	Revision
Date: 12/3/2009		Sheet of
File: \..\Blackfin.SchDoc		Drawn By:



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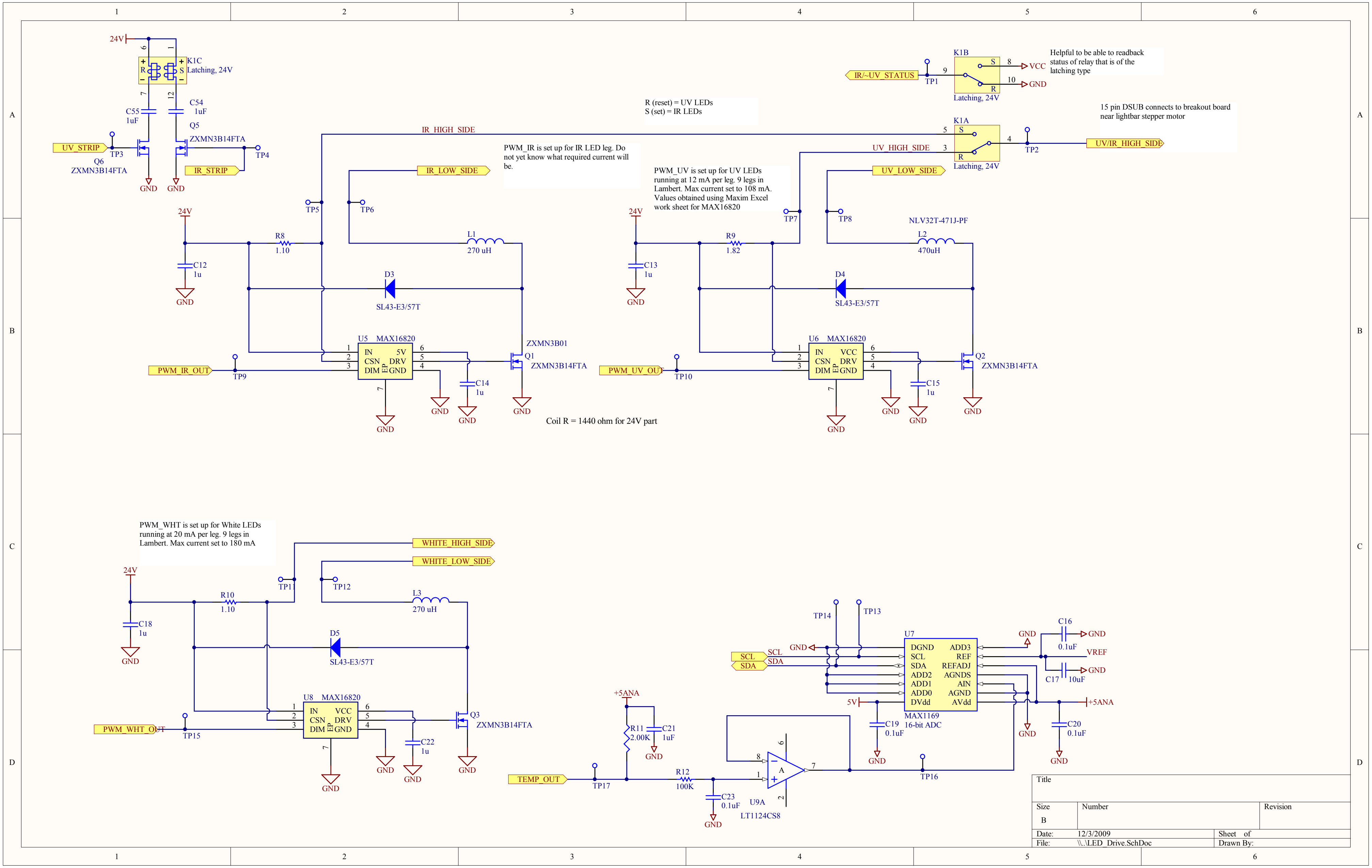

Helpful to be able to readback status of relay that is of the latching type

R (reset) = UV LEDs
S (set) = IR LEDs

15 pin DSUB connects to breakout board near lightbar stepper motor

PWM_IR is set up for IR LED leg. Do not yet know what required current will be.

PWM_UV is set up for UV LEDs running at 12 mA per leg. 9 legs in Lambert. Max current set to 108 mA. Values obtained using Maxim Excel work sheet for MAX16820

Coil R = 1440 ohm for 24V part

PWM_WHT is set up for White LEDs running at 20 mA per leg. 9 legs in Lambert. Max current set to 180 mA

Title		
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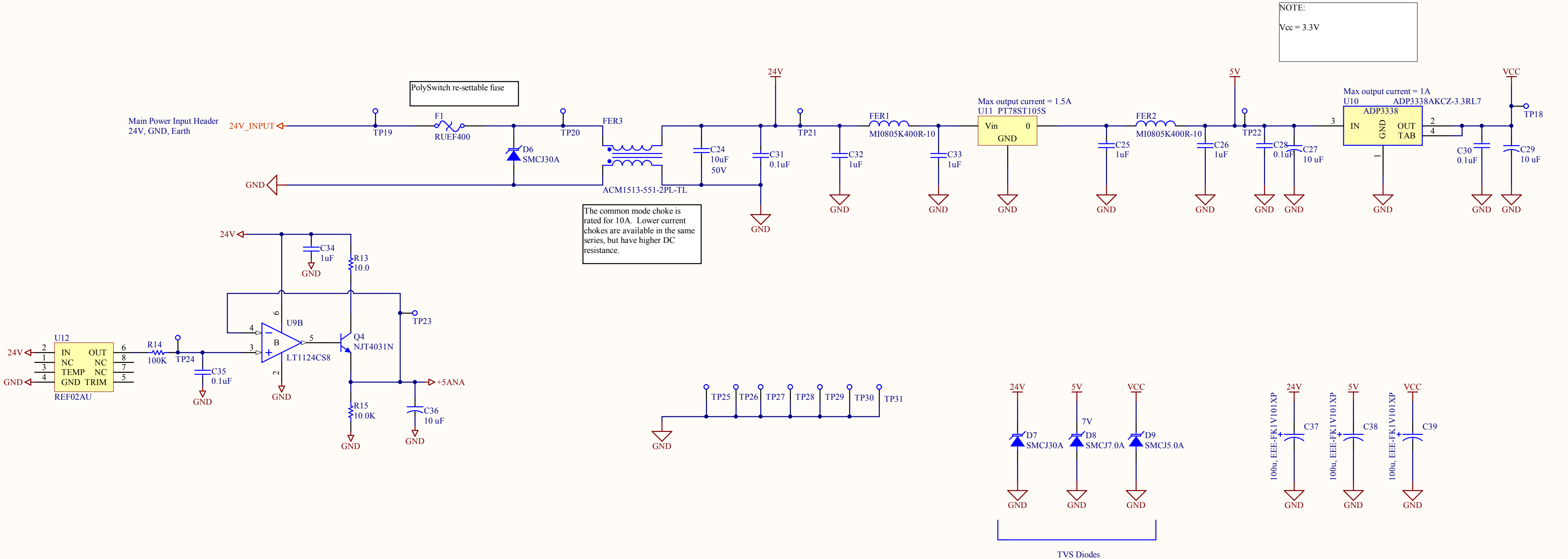
This page is the main power input stage. It takes 24Vdc in and converts it to 5V and 3.3V. Filtering and transient protection is also on this page.

The PT78ST105S is a switching buck converter. It outputs 5V with a maximum output current of 1.5A.

The ADP3338 is a 3.3V linear regulator with a maximum output current of 1A.



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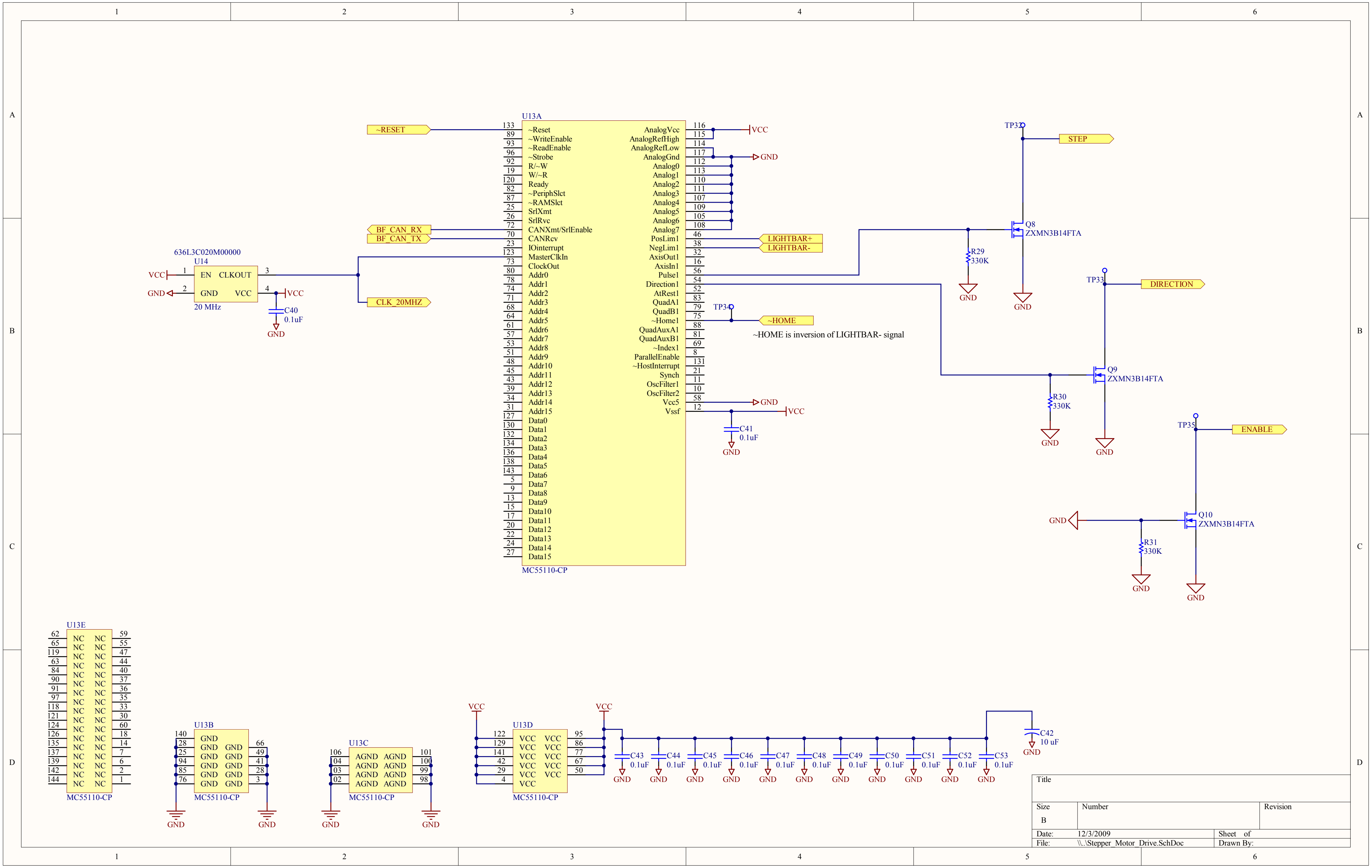
File: \\..\Power Input.SchDoc		Drawn By:



~HOME is inversion of LIGHTBAR- signal

Title

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File: \\..\Stepper_Motor_Drive.SchDoc

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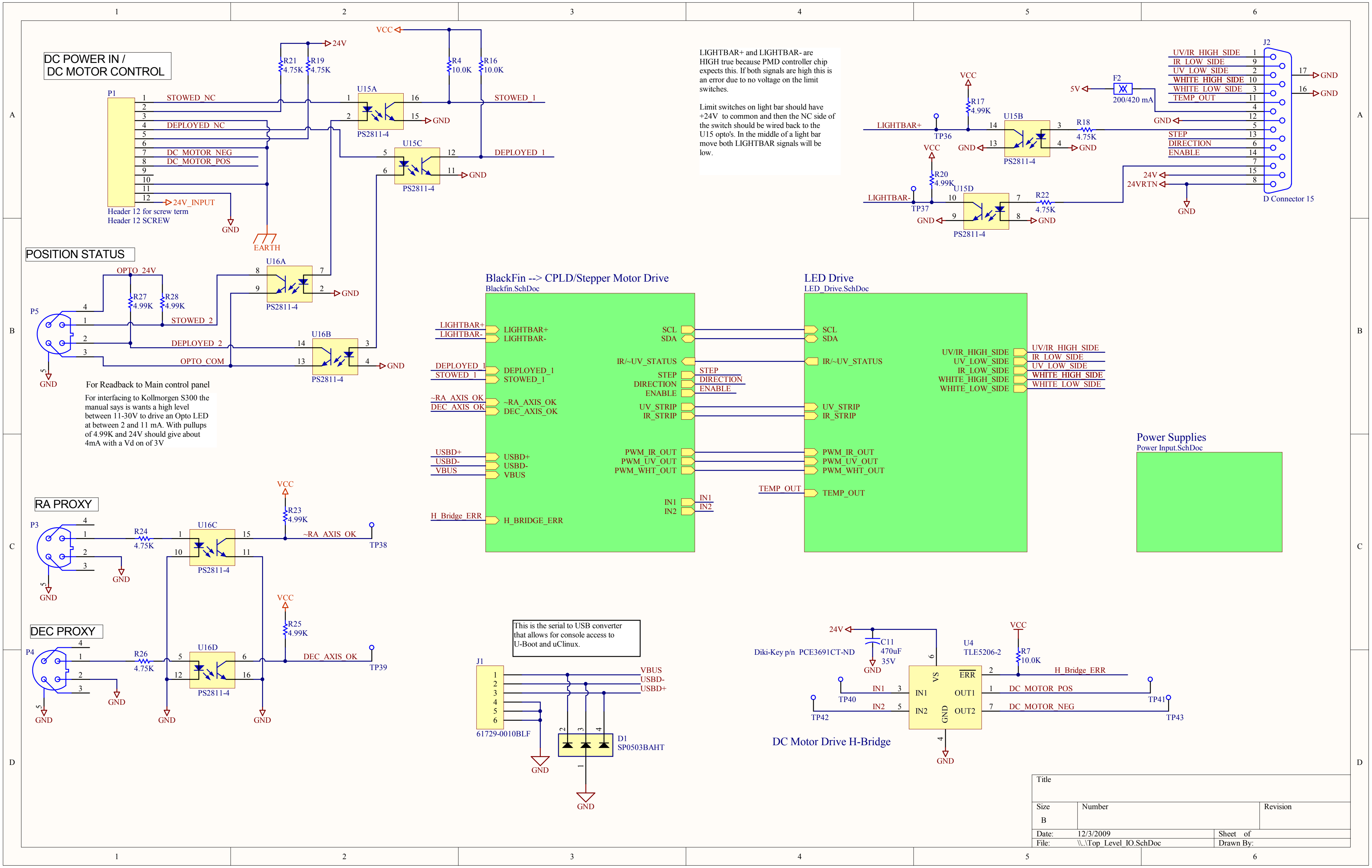

LIGHTBAR+ and LIGHTBAR- are HIGH true because PMD controller chip expects this. If both signals are high this is an error due to no voltage on the limit switches.

Limit switches on light bar should have +24V to common and then the NC side of the switch should be wired back to the U15 opto's. In the middle of a light bar move both LIGHTBAR signals will be low.

For Readback to Main control panel

For interfacing to Kollmorgen S300 the manual says is wants a high level between 11-30V to drive an Opto LED at between 2 and 11 mA. With pullups of 4.99K and 24V should give about 4mA with a Vd on of 3V

This is the serial to USB converter that allows for console access to U-Boot and uClinux.

Diki-Key p/n PCE3691CT-ND

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