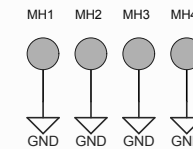
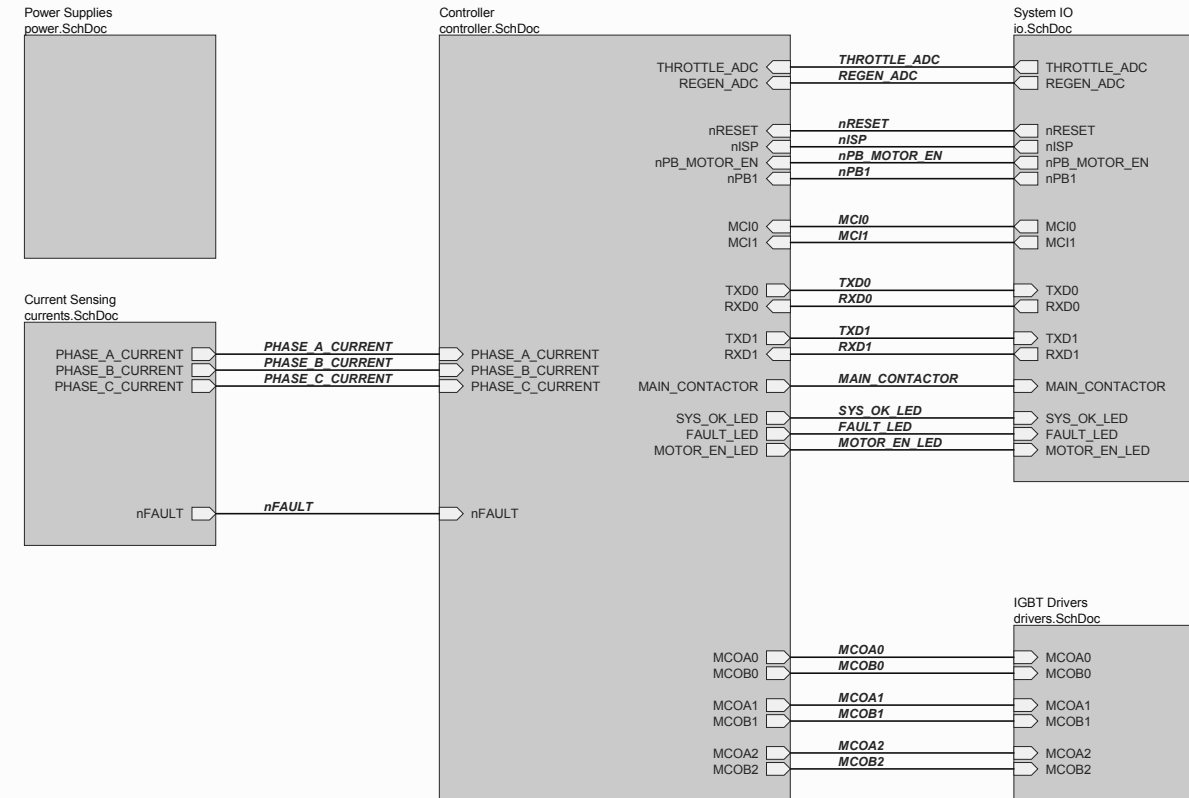


AC Induction Motor Controller

Revision A

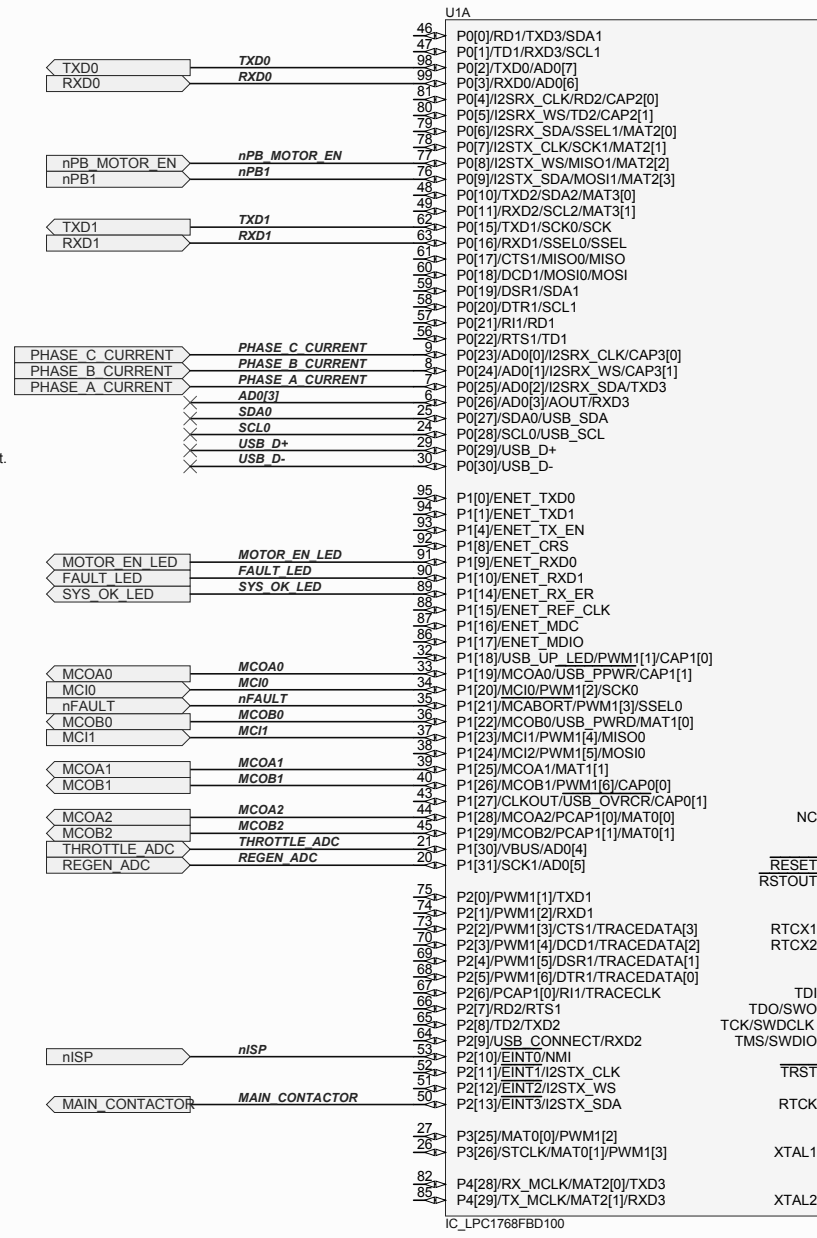
Chris Hii

<http://www.chrishii.ca>



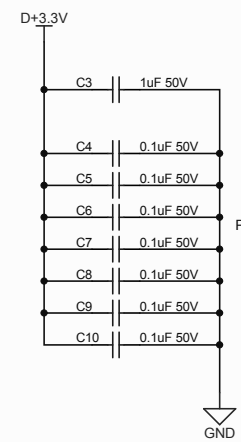
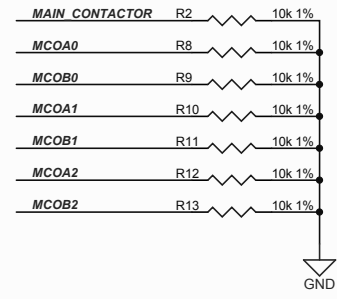
Title		
Size	Number	Revision
A		
Date:	12/8/2013	Sheet of
File:	D:\svn\main.SchDoc	Drawn By: Chris Hii

LPC1768

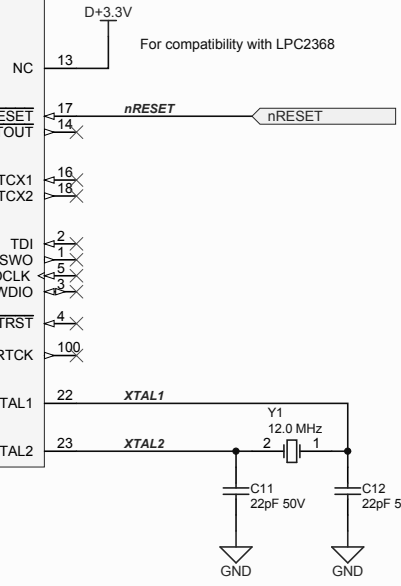
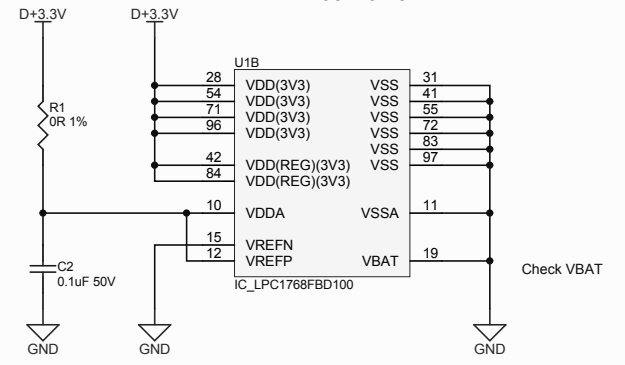


Note: Most GPIOs are 5V tolerant.

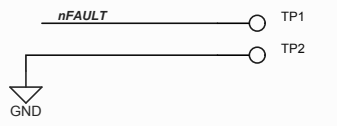
Pull Downs



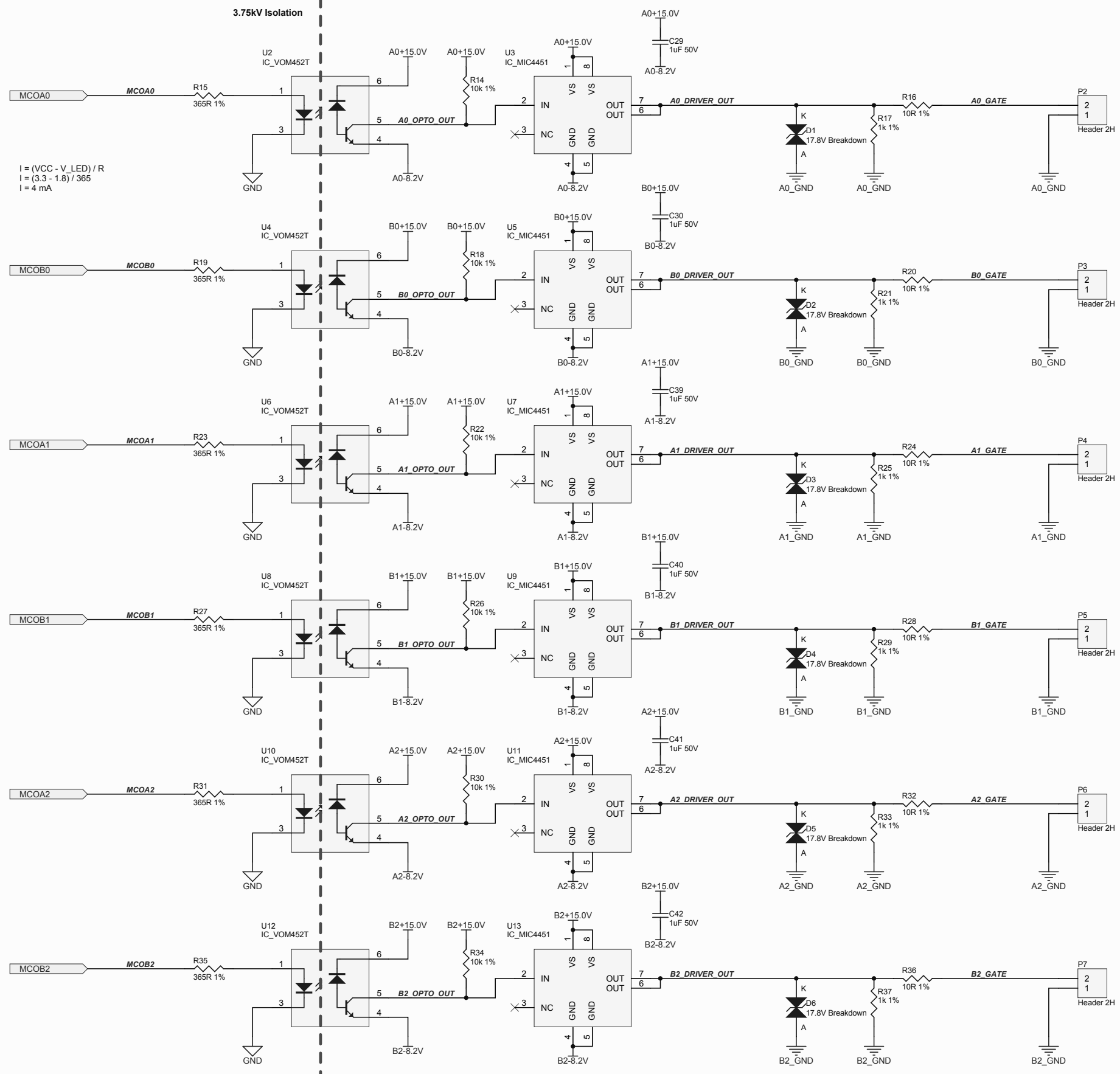
LPC1768 Power



Debug Testpoints



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$$I = (V_{CC} - V_{LED}) / R$$

$$I = (3.3 - 1.8) / 365$$

$$I = 4 \text{ mA}$$

$$P_{\text{gate}} = (V_{\text{ge_on}} - V_{\text{ge_off}}) * Q_g * f_{\text{sw}}$$

$$P_{\text{gate}} = 24V * 40nC * 4kHz$$

$$P_{\text{gate}} = 4.8mW$$

$$I_{\text{peak}} = (V_{\text{ge_on}} - V_{\text{ge_off}}) / R_g$$

$$I_{\text{peak}} = 24V / 10R$$

$$I_{\text{peak}} = 2.4A$$

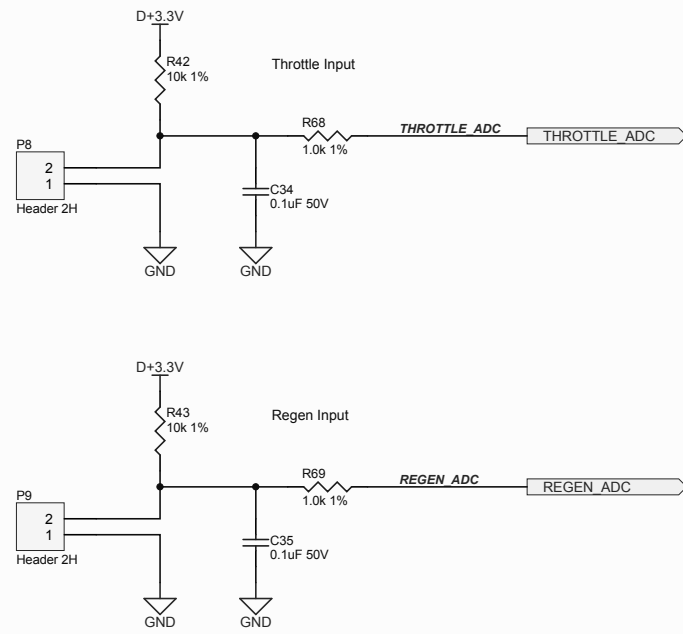
TODO: Replace gate resistors with thru-hole footprints?
 TODO: <(" <")

Debug Testpoints

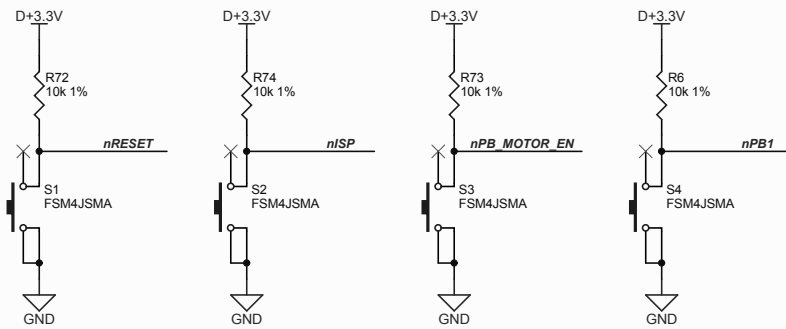
- MCOA0 ○ TP5
- MCOB0 ○ TP6
- MCOA1 ○ TP7
- MCOB1 ○ TP8
- MCOA2 ○ TP9
- MCOB2 ○ TP10

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File:	D:\svn\...drivers.SchDoc	Drawn By:
		Chris Hii

Throttle/Regen Inputs

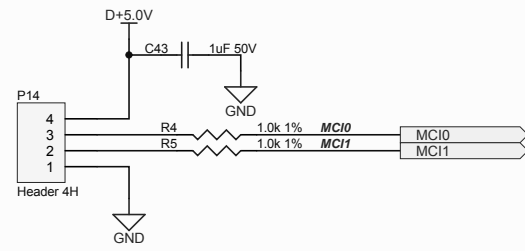


Pushbuttons

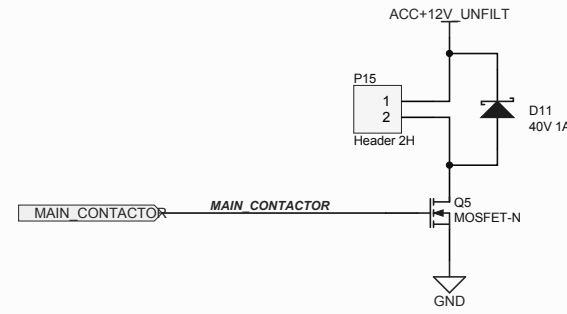


Encoder Input

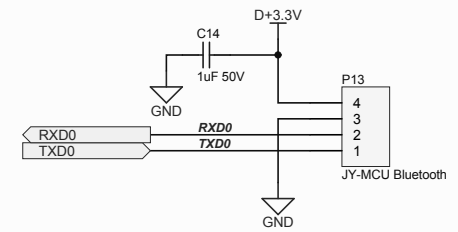
TODO: Find encoder, add interface circuitry



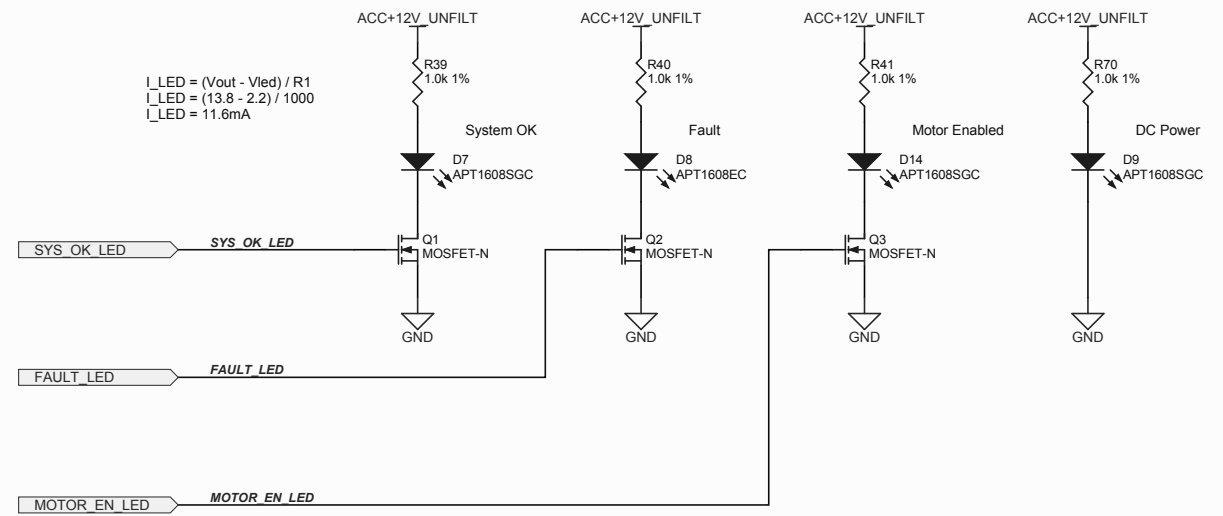
Contactor Control



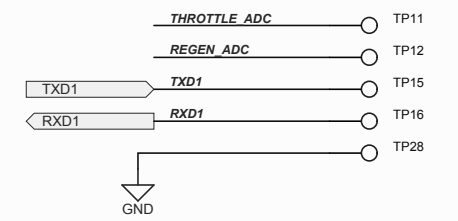
Bluetooth Serial



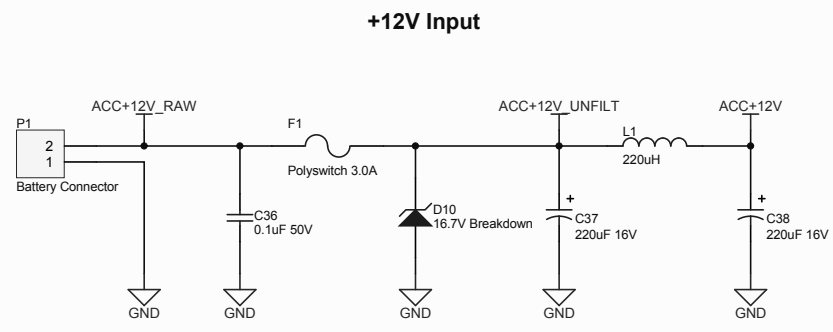
Status LEDs



Debug Testpoints



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Inductor limited to 560mA max, 0.91R DCR

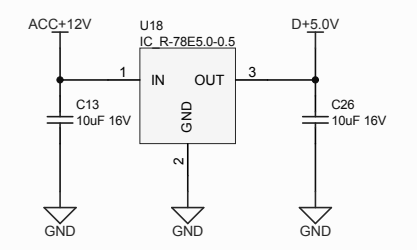
Filter values and filter itself are provisional - may be bypassed for efficiency.

$$F_c = 1 / (\pi * \text{sqrt}(L * C))$$

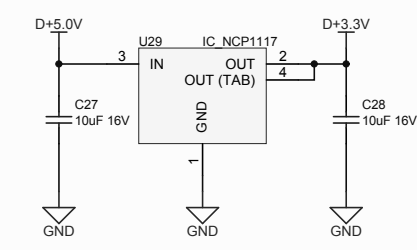
VBAT Range:
14.4V Fully Charged
10.8V Low Voltage Cutoff

PCE3788CT-ND

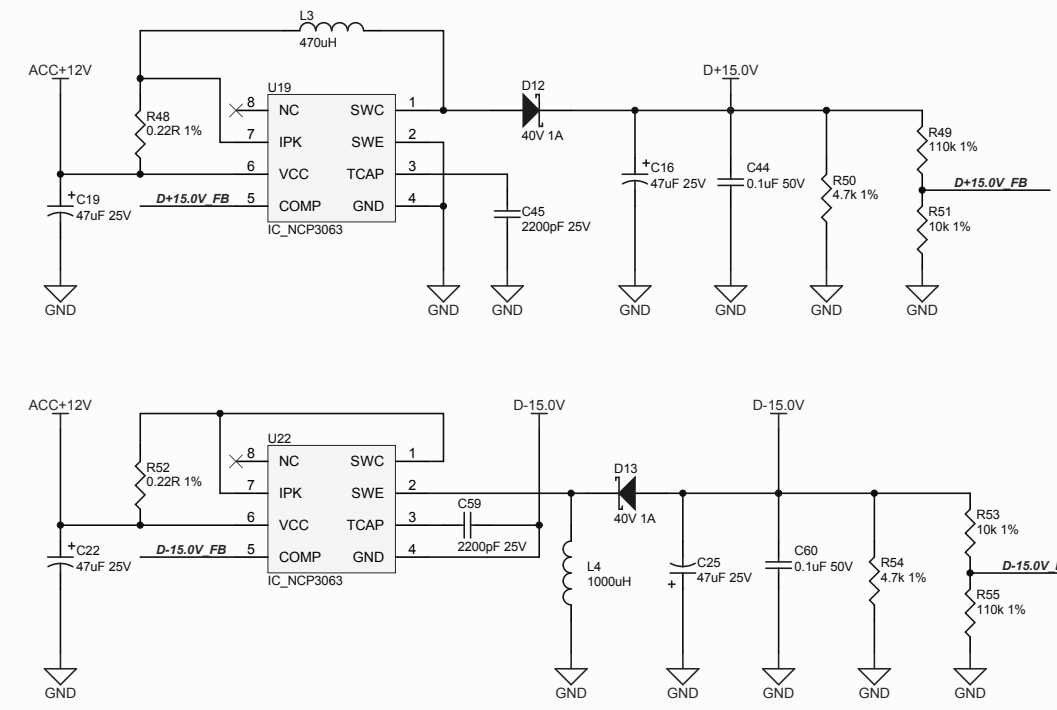
5.0V 300mA Supply



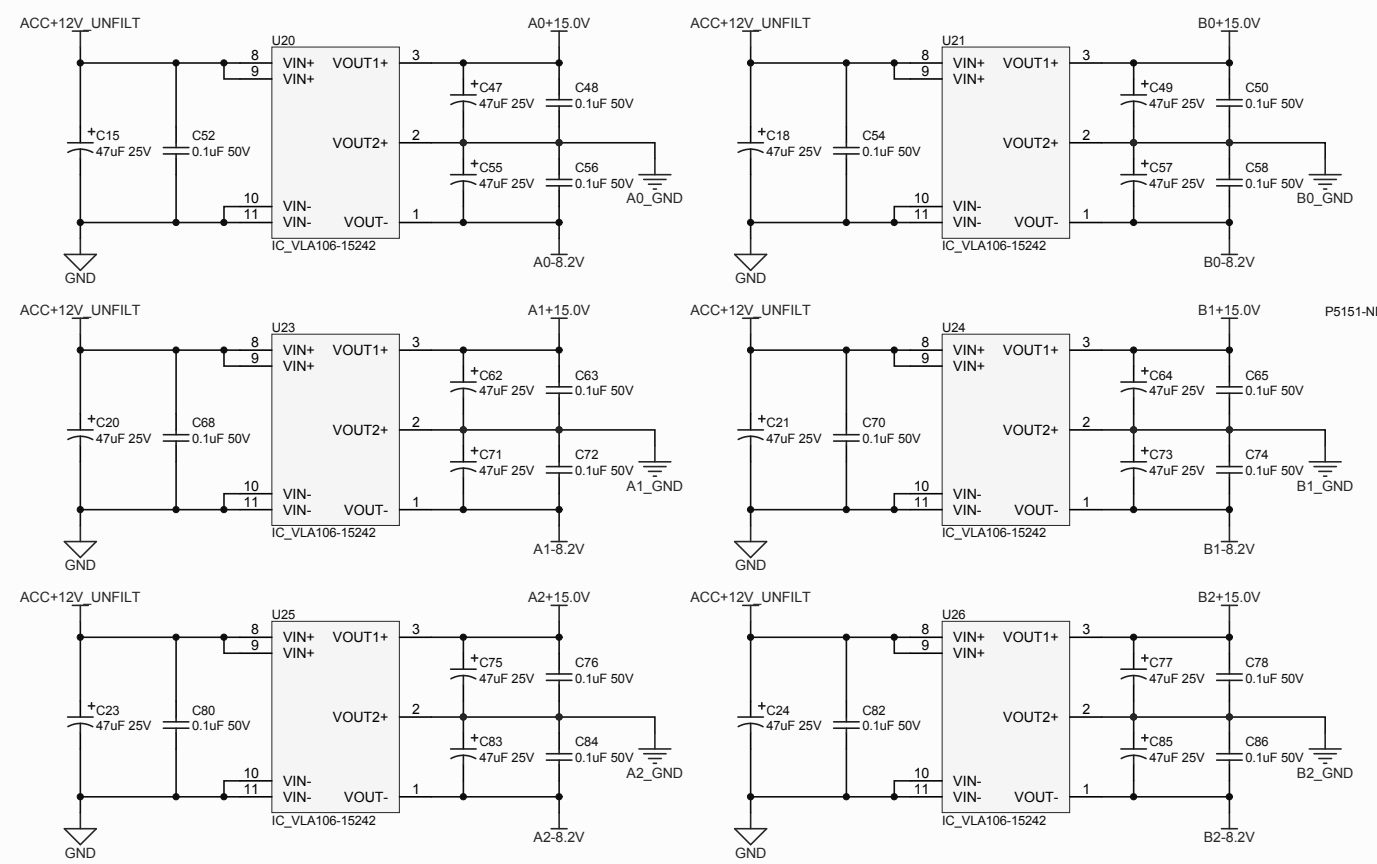
3.3V 100mA Supply



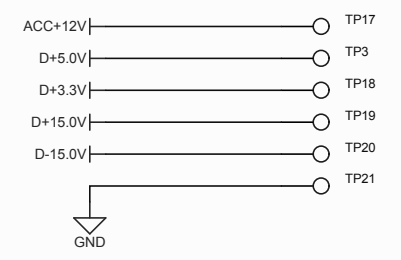
+/- 15V 100mA Supplies for Current Sensors



Isolated +15V/-8.2V Supplies

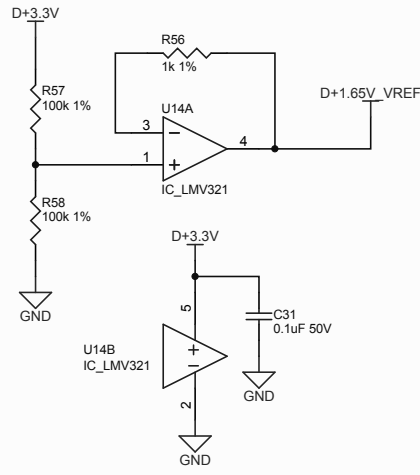


Debug Testpoints

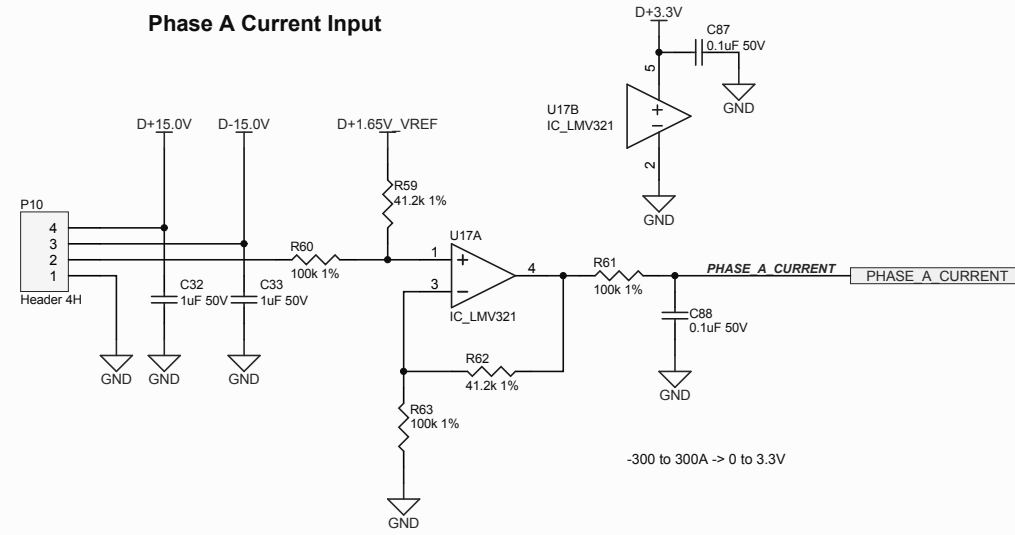


Title		
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A		
Date:	12/8/2013	Sheet of
File:	D:\svn\..power.SchDoc	Drawn By: Chris Hii

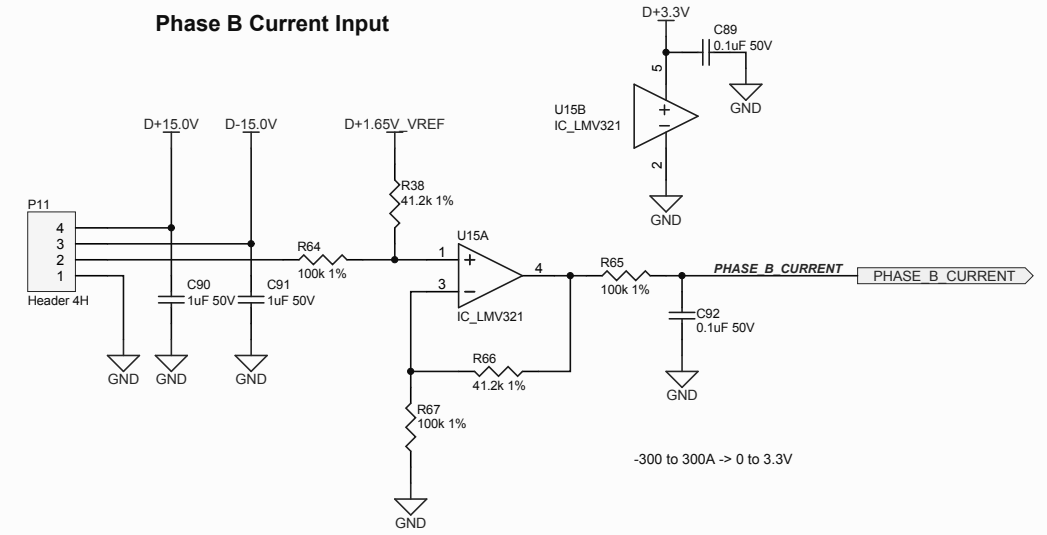
1.65V Reference



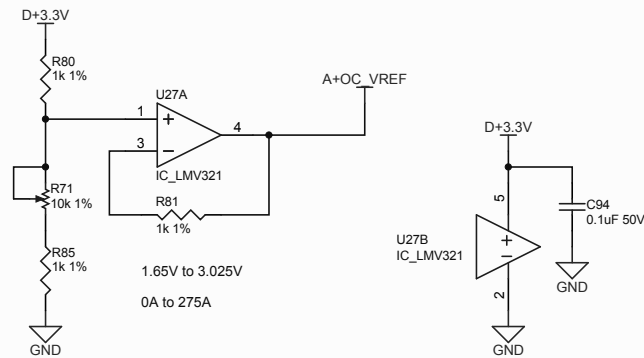
Phase A Current Input



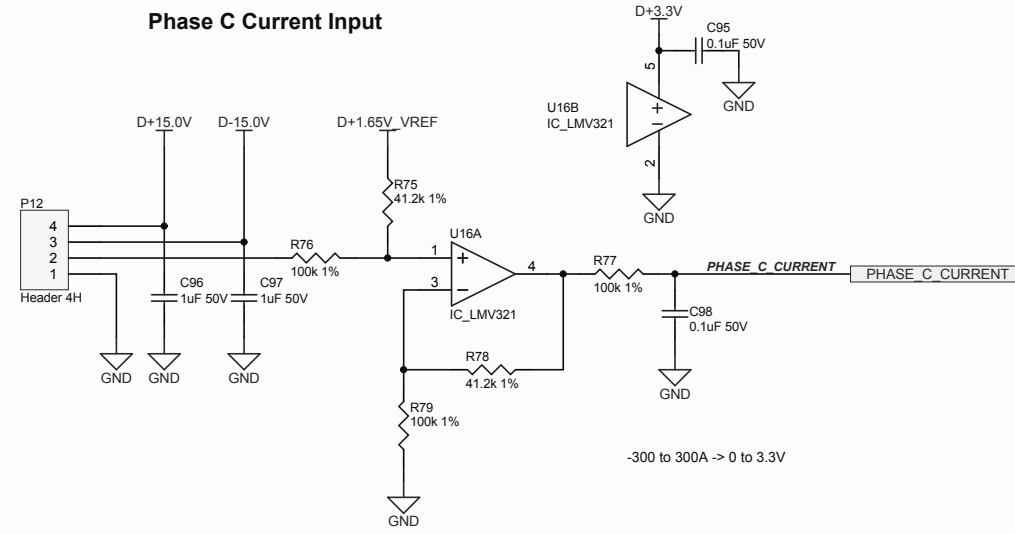
Phase B Current Input



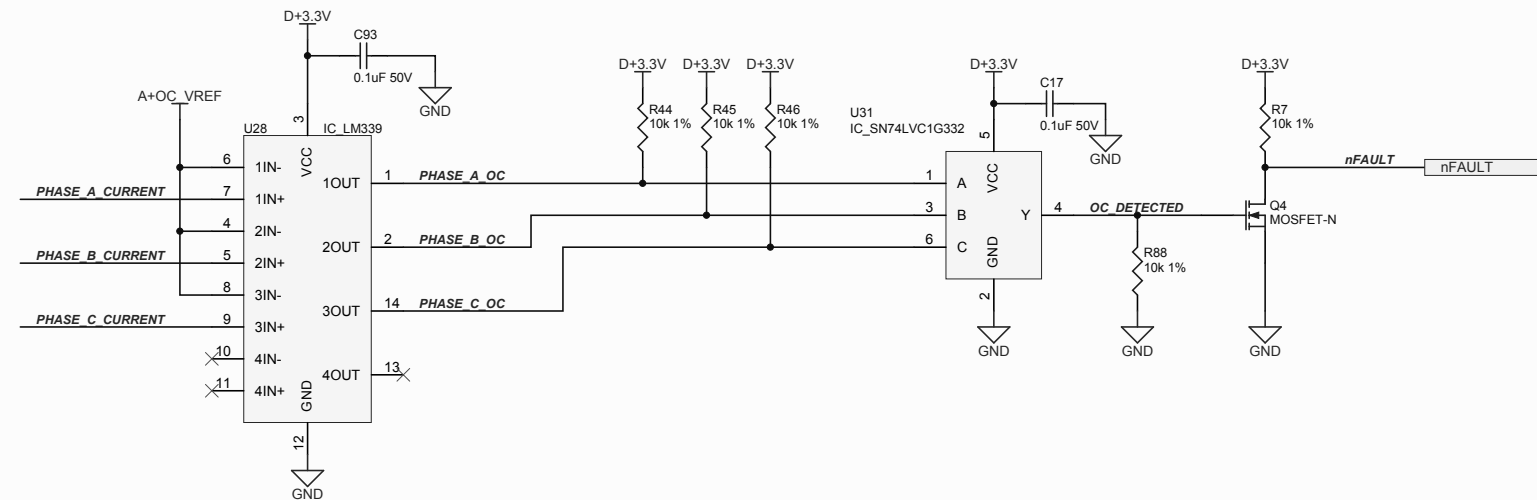
Overcurrent Voltage Reference



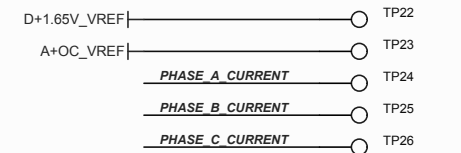
Phase C Current Input



Overcurrent Fault Detection



Debug Testpoints



Title		
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A		
Date:	12/8/2013	Sheet of
File:	D:\svn\...currents.SchDoc	Drawn By: