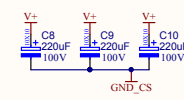
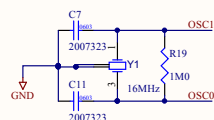
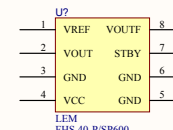
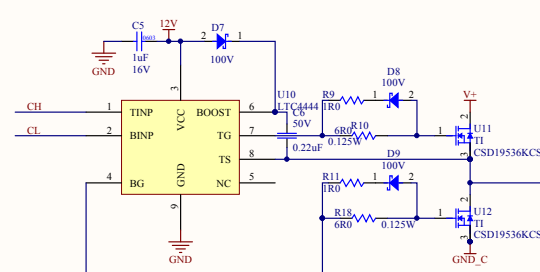
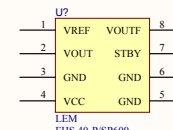
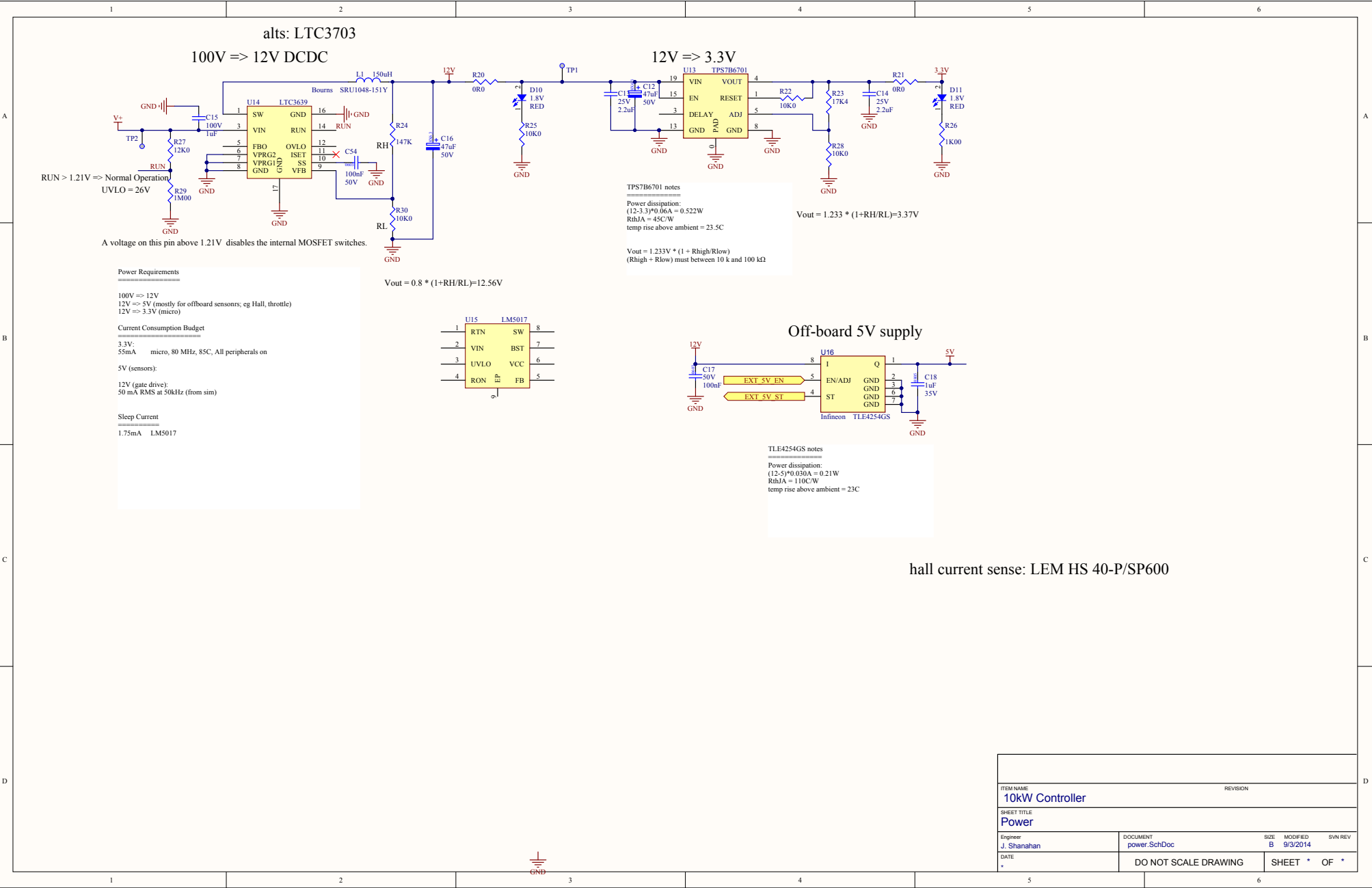
[illegible]

hall current sense: LEM HS 40-P/SP600

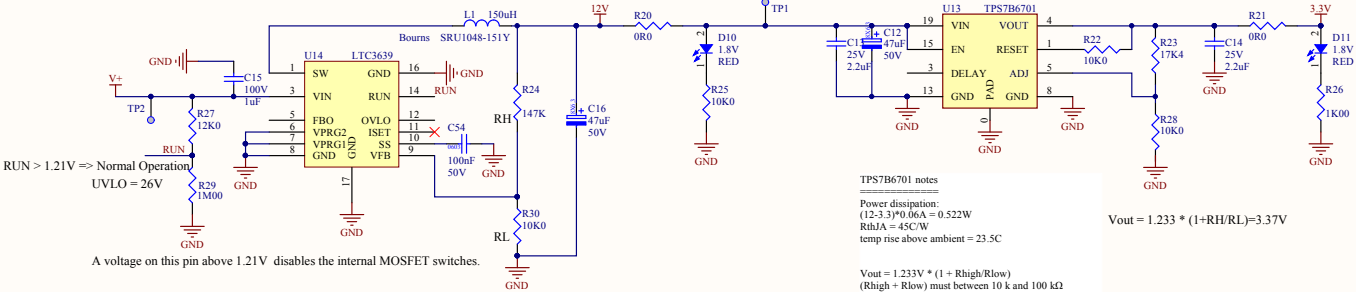
ITEM NAME <b>10kV Controller</b>		REVISION	
SHEET TITLE #			
Engineer <b>J. Shanahan</b>	DOCUMENT <b>mcu.SchDoc</b>	SIZE <b>B</b>	MODIFIED <b>9/3/2014</b>
DATE	<b>DO NOT SCALE DRAWING</b>	<b>SHEET</b>	<b>* OF *</b>



alts: LTC3703

100V => 12V DCDC

12V => 3.3V



TPS7B6701 notes  
Power dissipation:  
(12-3.3)\*0.06A = 0.522W  
RthJA = 45C/W  
temp rise above ambient = 23.5C  
  
Vout = 1.233V \* (1 + Rhigh/Rlow)  
(Rhigh + Rlow) must be between 10 k and 100 kΩ

$V_{out} = 1.233 * (1 + R_H/R_L) = 3.37V$

Power Requirements

100V => 12V  
12V => 5V (mostly for off-board sensors; eg Hall, throttle)  
12V => 3.3V (micro)

Current Consumption Budget

3.3V:  
55mA micro, 80 MHz, 85C, All peripherals on

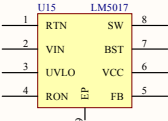
5V (sensors):

12V (gate drive):  
50 mA RMS at 50kHz (from sim)

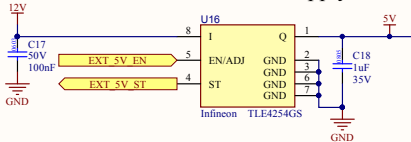
Sleep Current

1.75mA LM5017

$V_{out} = 0.8 * (1 + R_H/R_L) = 12.56V$



Off-board 5V supply

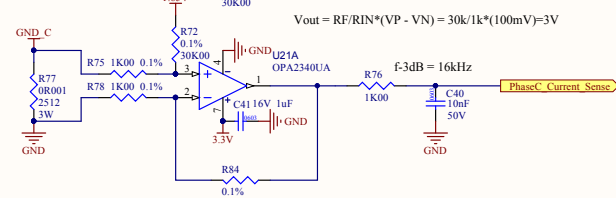
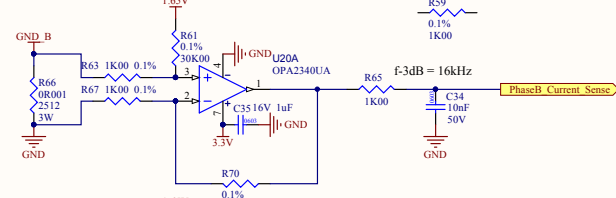
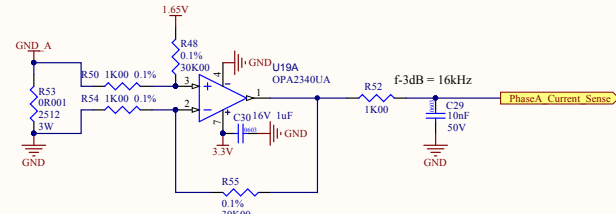
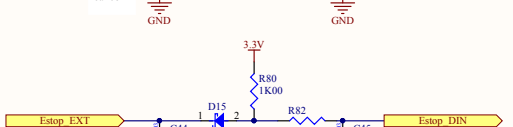
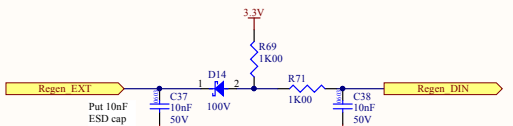
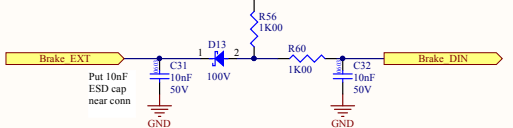
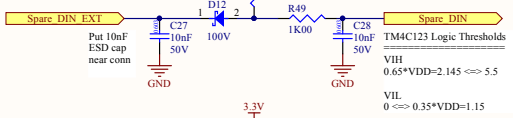
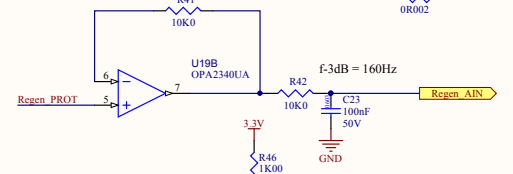
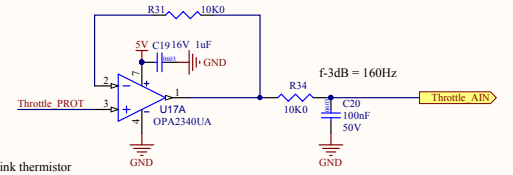
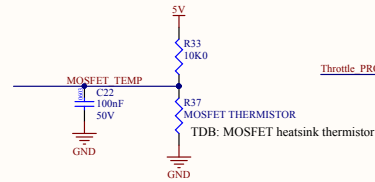
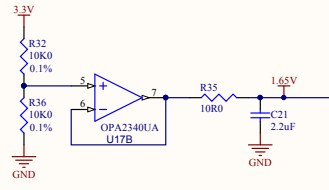
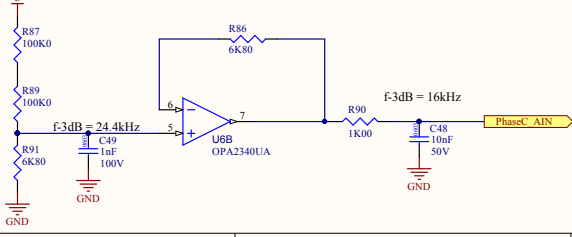
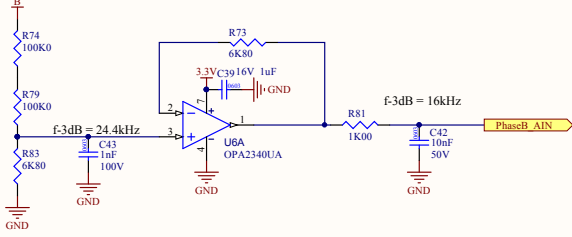
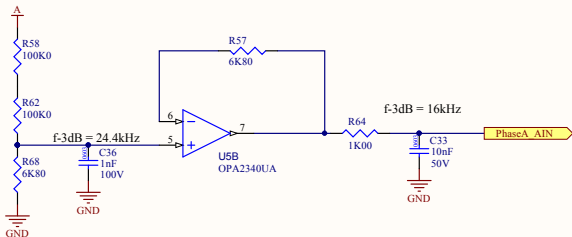
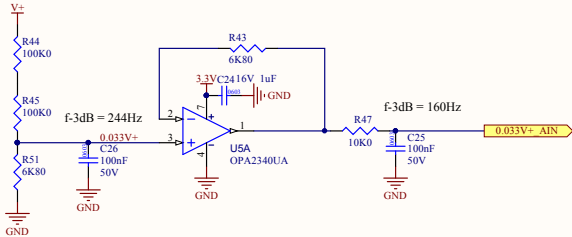
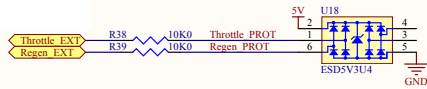


TLE4254GS notes  
Power dissipation:  
(12-5)\*0.030A = 0.21W  
RthJA = 110C/W  
temp rise above ambient = 23C

hall current sense: LEM HS 40-P/SP600

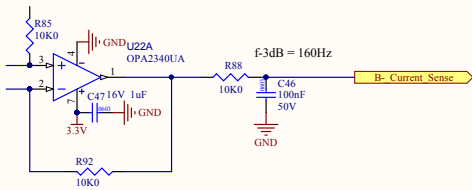
ITEM NAME		REVISION	
10kW Controller			
SHEET TITLE			
Power			
Engineer	DOCUMENT	SIZE	MODIFIED
J. Shanahan	power.SchDoc	B	9/3/2014
DATE			SWN REV
+	DO NOT SCALE DRAWING		SHEET * OF *

Sensors  
 =====  
 V+ = volt sense  
 B- = curr sense  
 phase voltage sense  
 phase curr sense on ground leg  
 analog inputs: throttle, regen, mosfet heatsink thermistor  
 digital inputs: brake, regen, estop



$$V_{out} = R_F / R_{IN} * (V_P - V_N) = 30k / 1k * (100mV) = 3V$$

100A => 100mV



$$BW = 0.35 / RiseTime$$

hall current sense: LEM HS 40-P/SP600

ITEM NAME		REVISION	
10kW Controller			
SHEET TITLE		SHEET * OF *	
Engineer		DOCUMENT	SIZE
J. Shanahan		sensors.SchDoc	B
DATE		MODIFIED	SWN REV
+		9/3/2014	
DO NOT SCALE DRAWING			