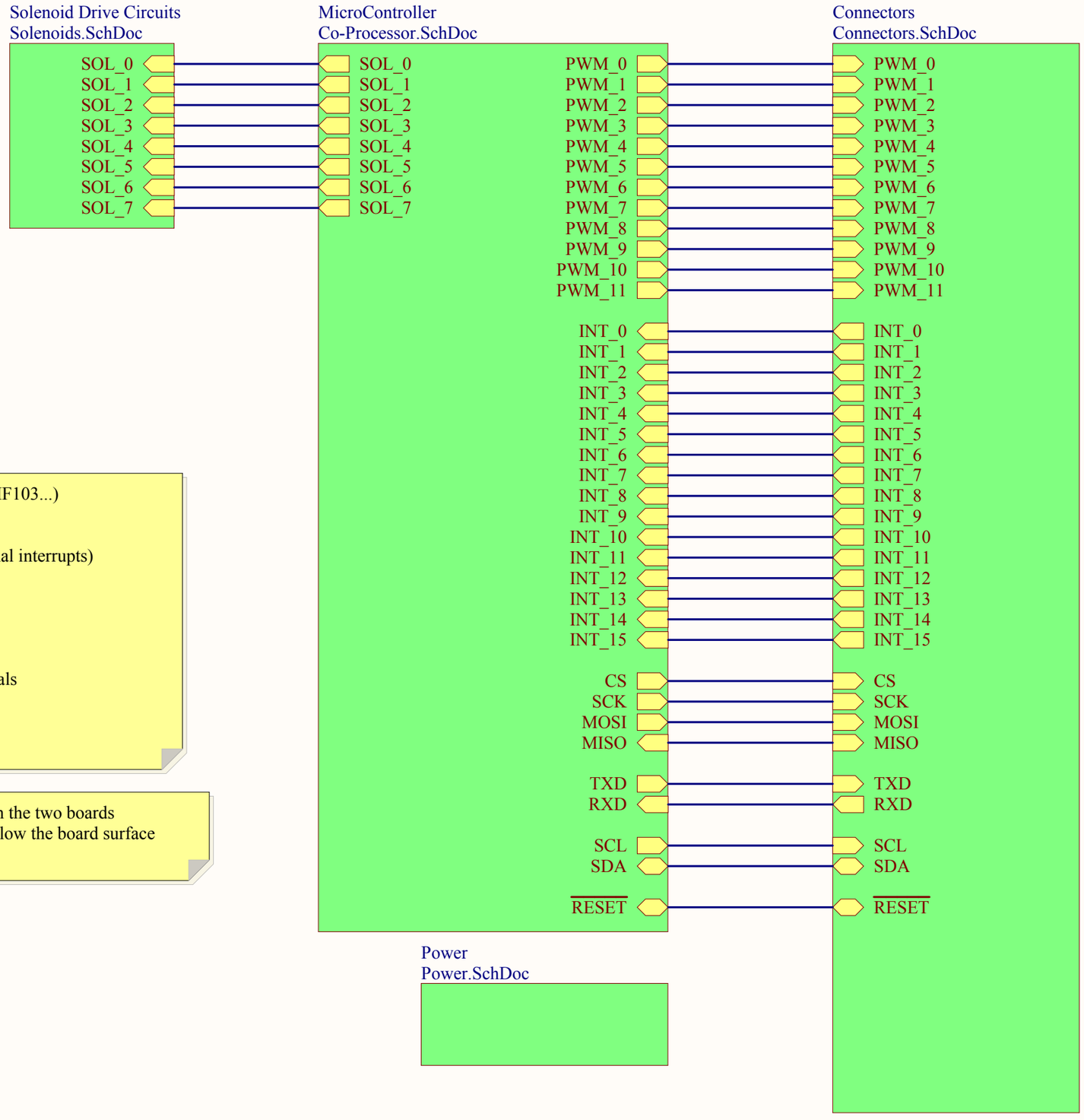

Co-Processor Signals (STMF103...)
12 PWM
8 Solenoid outputs
8 Encoder Inputs (16 external interrupts)

YUN Processor Signals
12-14 DIO
6 Analog Inputs

Co-Processor & YUN Signals
1 I2C
1 SPI
1 USART

0.499" mil distance between the two boards
0.416" length of the pins below the board surface

Top Level		
Size: A	Date: 6/13/2014	Revision: 1.0
Engineer: K. Chambles		Sheet: 1 of 5
Drawn By: K. Chambles		

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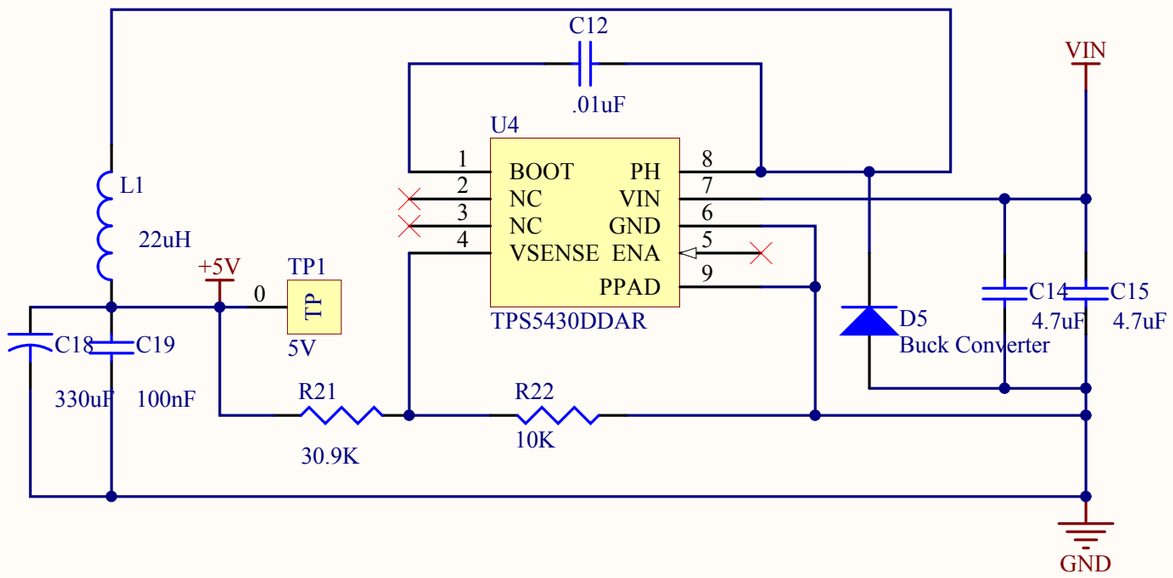

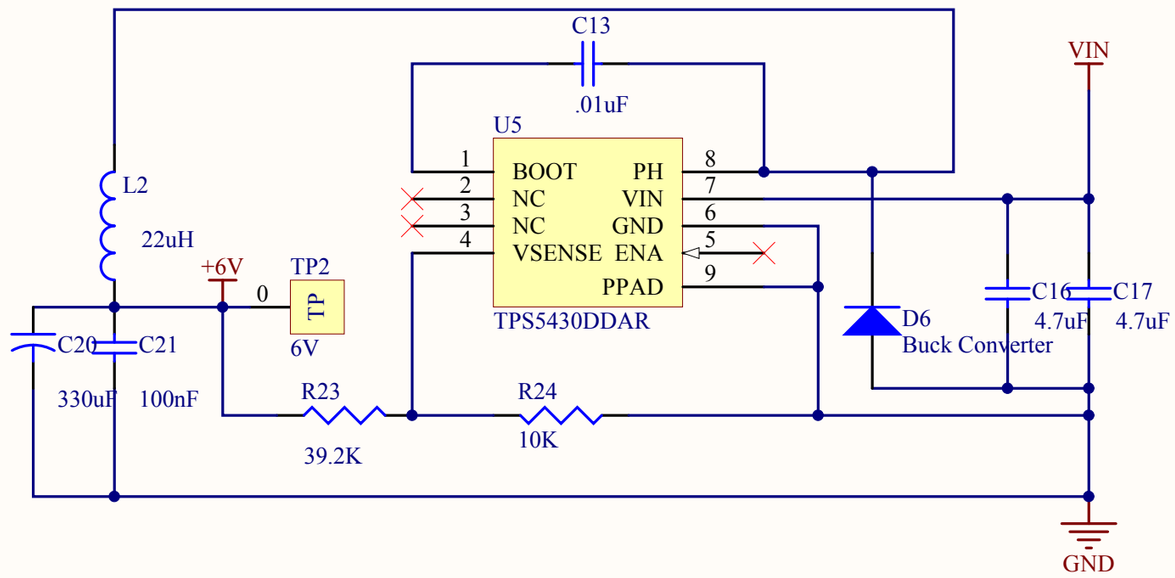

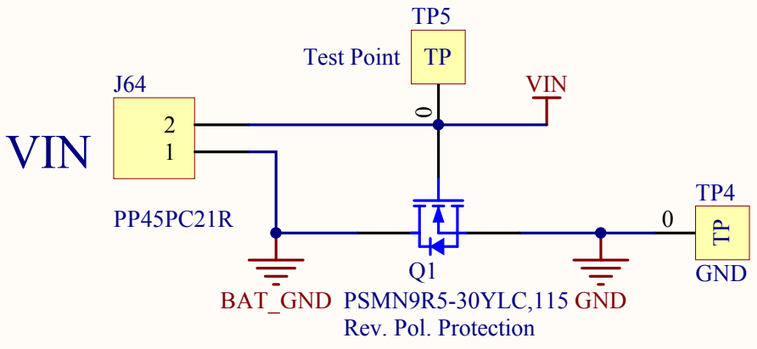

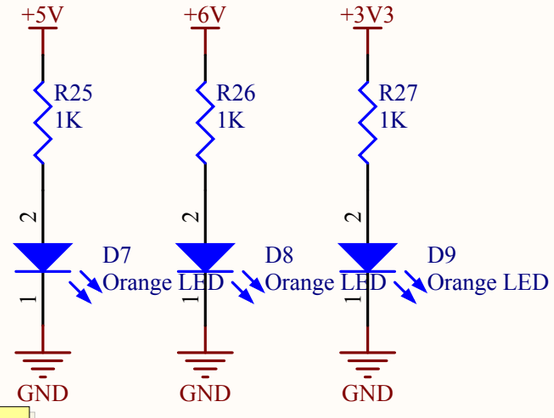

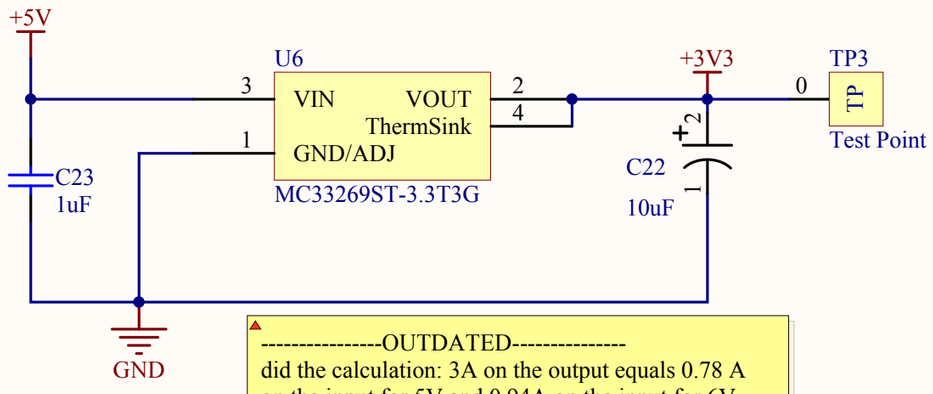

----------OUTDATED----------
The maximum output voltage, given a minimum input voltage of 6V with a variety of output currents,
ranges from 5.13 V (when Io = 0.1 A) to 4.46 V (when Io = 3 A)

Voutmax = 0.87 * ((Vinmin - Iomax * 0.230) + Vd) (Iomax * RL) Vd

----------OUTDATED----------
did the calculation: 3A on the output equals 0.78 A on the input for 5V and 0.94A on the input for 6V

that is with 80% efficient and it should be higher than this, so we are good, I have a trace width available for about 7A, therefore 4A on Solenoid, plus 2A on 5V & 6V brings us to 6

Power		
Size: A	Date: 6/13/2014	Revision: 1.0
Engineer: K. Chambles		Sheet: 2 of 5
Drawn By: K. Chambles		

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12 PWM outputs
1 ouput UART
3 outputs SPI
8 solenoid outputs (optional)

16 encoder inputs (3 inputs need voltage level translation)
1 input UART
1 input SPI

Output Translator

U2A

+5V, +3V3, GND, C1 1uF, C2 1uF

TXD	TXD	2	1B1	1A1	47	TXD_3.3V
MOSI	MOSI	3	1B2	1A2	46	MOSI_3.3V
SCK	SCK	5	1B3	1A3	44	SCK_3.3V
CS	CS	6	1B4	1A4	43	CS_3.3V
PWM_0	PWM_0	8	1B5	1A5	41	PWM_0_3.3V
PWM_1	PWM_1	9	1B6	1A6	40	PWM_1_3.3V
PWM_2	PWM_2	11	1B7	1A7	38	PWM_2_3.3V
PWM_3	PWM_3	12	1B8	1A8	37	PWM_3_3.3V

VCCB 7, VCCA 42; GND 4, 10, GND 45, 39; 1DIR 1, 1OE 48

IDT74ALVC164245PAG8

xO\E\ & xDIR are referenced to VCCA
L & L data enabled, from B to A
L & H data enabled, from A to B

Output Translator

U2B

+5V, +3V3, GND, C3 1uF, C4 1uF

PWM_4	PWM_4	13	2B1	2A1	36	PWM_4_3.3V
PWM_5	PWM_5	14	2B2	2A2	35	PWM_5_3.3V
PWM_6	PWM_6	16	2B3	2A3	33	PWM_6_3.3V
PWM_7	PWM_7	17	2B4	2A4	32	PWM_7_3.3V
PWM_8	PWM_8	19	2B5	2A5	30	PWM_8_3.3V
PWM_9	PWM_9	20	2B6	2A6	29	PWM_9_3.3V
PWM_10	PWM_10	22	2B7	2A7	27	PWM_10_3.3V
PWM_11	PWM_11	23	2B8	2A8	26	PWM_11_3.3V

VCCB 18, VCCA 31; GND 15, 21, GND 34, 28; 2DIR 24, 2OE 25

IDT74ALVC164245PAG8

xO\E\ & xDIR are referenced to VCCA
L & L data enabled, from B to A
L & H data enabled, from A to B

Input Translator

U3

+3V3, +5V, GND, C5 1uF, C6 1uF

INT_13_3.3V	5	A0	B0	20	
INT_14_3.3V	6	A1	B1	19	INT_13
INT_15_3.3V	7	A2	B2	18	INT_14
MISO_3.3V	8	A5	B3	17	INT_15
RXD_3.3V	9	A4	B4	16	MISO
RESET_3.3V	10	A5	B5	15	RXD
		A6	B6	14	RESET
		A7	B7		

VCCA 1, VCCB 24; GND 11, NC 23; GND 12, GND 13; T/R 2, OE 22; 21

74LVX3245MTCX

O\E\ & T/R\ are referenced to VCCA
L & L data enabled, from B to A
L & H data enabled, from A to B

U1A

PWM_4_3.3V	TIM2_CH1_ETR	14	PA0-WKUP	PB0	26	TIM3_CH3	PWM_10_3.3V
PWM_5_3.3V	TIM2_CH2	15	PA1	PB1	27	TIM3_CH4	PWM_11_3.3V
PWM_6_3.3V	TIM2_CH3	16	PA2	PB2	28	FT EXT 2-2	INT_12
PWM_7_3.3V	TIM2_CH4	17	PA3	PB3	55	FT EXT 3-2	INT_12
SOL_5		20	PA4	PB4	56	FT EXT 4-2	INT_0
SOL_6		21	PA5	PB5	57	EXT 5-2	INT_1
PWM_8_3.3V	TIM3_CH1	22	PA6	PB6	58	TIM4_CH1	INT_13_3.3V
PWM_9_3.3V	TIM3_CH2	23	PA7	PB7	59	TIM4_CH2	PWM_0_3.3V
INT_9	EXT 8-1_FT	41	PA8	PB8	61	TIM4_CH3	PWM_1_3.3V
TXD_3.3V 0 R3	USART1_TX	42	PA9	PB9	62	TIM4_CH4	PWM_2_3.3V
RXD_3.3V 0 R4	USART1_RX	43	PA10	PB10	29	FT	PWM_3_3.3V
CTS_3.3V	EXT 11-1 FT	44	PA11	PB11	30	FT	SCL
RTS_3.3V	EXT 12-1 FT	45	PA12	PB12	33	FT SPI2_NSS	SDA
INT_6	EXT 13-1 FT	46	PA13	PB13	34	FT SPI2_SCK	CS_3.3V
INT_7	EXT 14-1 FT	49	PA14	PB14	35	FT SPI2_MISO	SCK_3.3V
INT_4	EXT 15-1 FT	50	PA15	PB15	36	FT SPI2_MOSI	MISO_3.3V
INT_5							MOSI_3.3V
INT_2							
INT_14_3.3V	EXT 0-3	8	PC0	PD0-OSC_IN	5		
INT_15_3.3V	EXT 1-3	9	PC1	PD1-OSC_OUT	6		
SOL_2		10	PC2	PD2	54		
SOL_3		11	PC3				
SOL_4		24	PC4				
SOL_7		25	PC5				
INT_10	EXT 6-3 FT	37	PC6				
INT_11	EXT 7-3 FT	38	PC7				
SOL_1		39	PC8	BOOT0	60	BOOT0 10K	R6
INT_8	EXT 9-3 FT	40	PC9				
INT_3	EXT 10-3 FT	51	PC10	NRST	7		
SOL_0		52	PC11			INT_12 R63	10K
		53	PC12				
		2	PC13-TAMPER-RTC			RESET_3.3V	
		3	PC14-OSC32_IN				
		4	PC15-OSC32_OUT				

STM32F103R8T6

R5 1M; Y1 8MHz; GND

Green: 1, 2 R7 470 G_LED, D1
Blue: 1, 2 R8 200 B_LED, D2
Red: 1, 2 R9 470 R_LED, D3

U1B

+3V3; VBAT 1; VDD_1 32, VDD_2 48, VDD_3 64, VDD_4 19, VDDA 13; VSS_1 31, VSS_2 47, VSS_3 63, VSS_4 18, VSSA 12

STM32F103R8T6

C7 1uF, C8 1uF, C10 1uF, C11 1uF, GND

+5V, R1 10K, R2 10K, SCL, SDA

J45: 1, 2; GND, DNP R19, BOOT0 0 R65, CTS_3.3V DNP R60, +3V3, TXD_3.3V, RXD_3.3V, RTS_3.3V DNP R61, C24 100nF RESET_3.3V

+3V3 R64 1K

J1: 1, 2, 3, 4, 5, 6 FTDI

+5V, R10 10K, D4, RESET, S1 FSM4JH, C9 22pF, GND

STM32F103 Co-Processor			
Size: B	Date: 6/13/2014	Revision: 1.0	
Engineer: K. Chambles		Sheet: 3 of 5	
Drawn By: K. Chambles			

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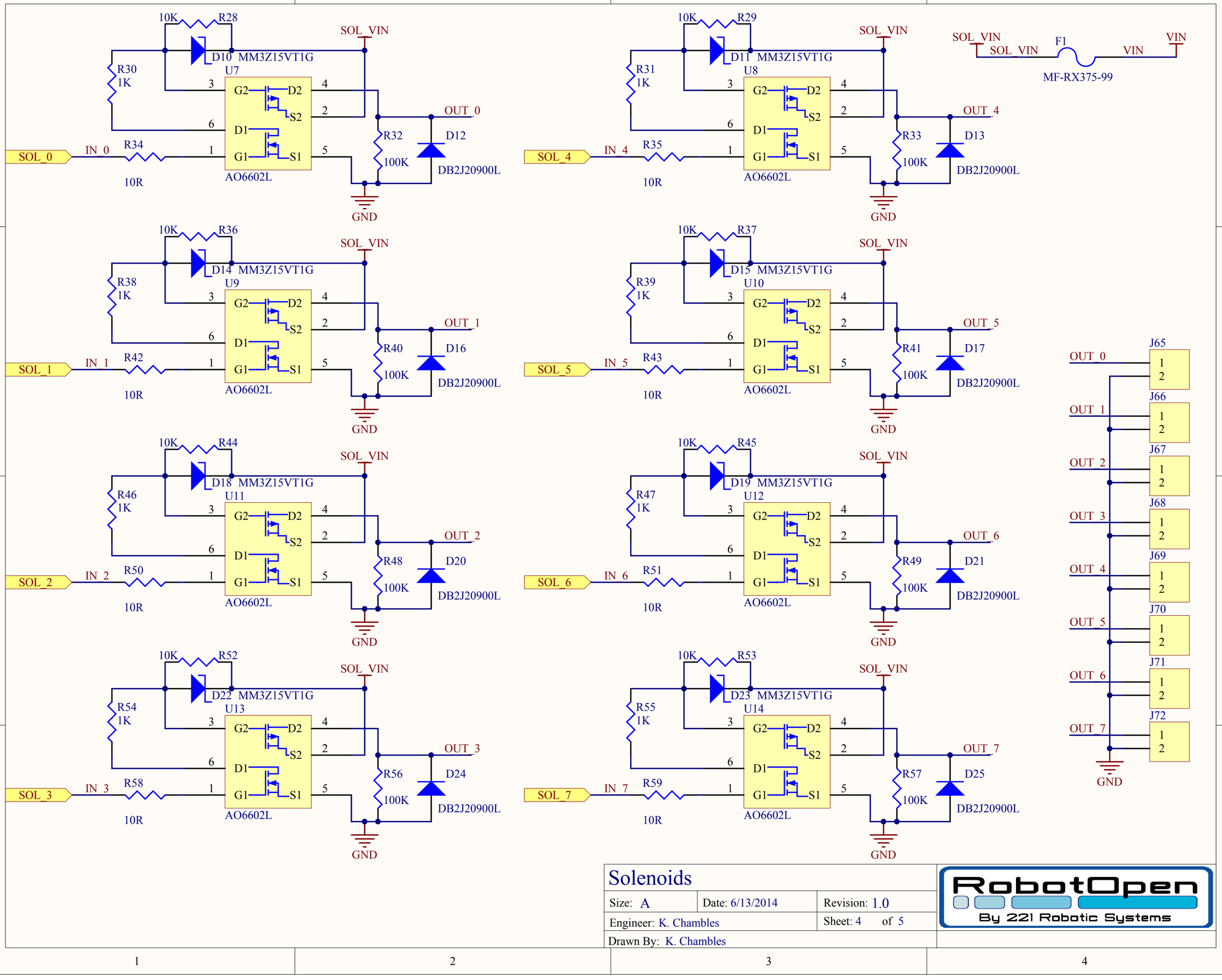

Solenoids

Size: A	Date: 6/13/2014	Revision: 1.0
Engineer: K. Chambles		Sheet: 4 of 5
Drawn By: K. Chambles		

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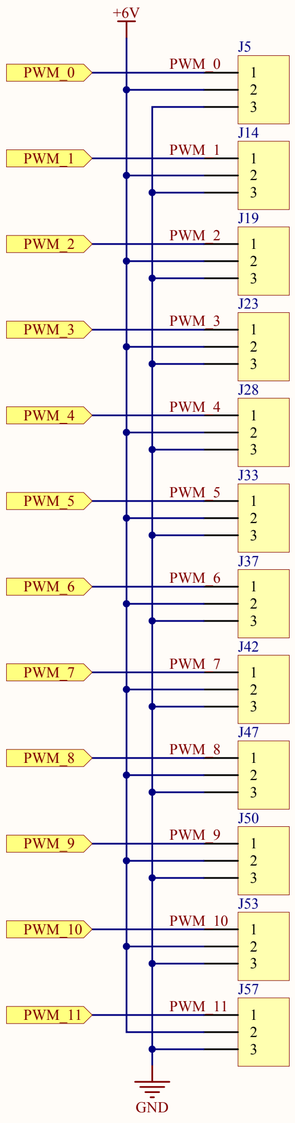
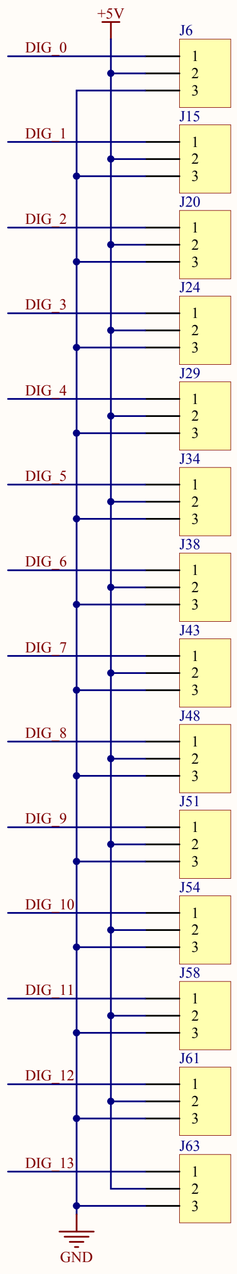
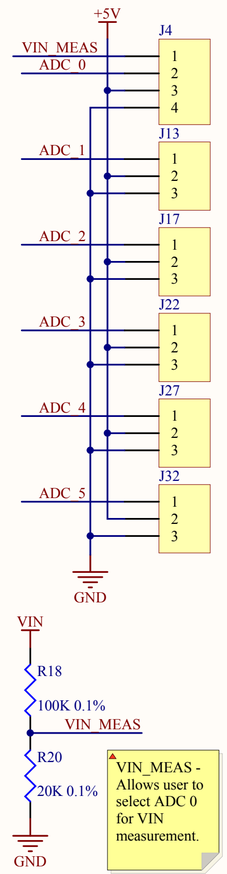
PWM



Digital IO

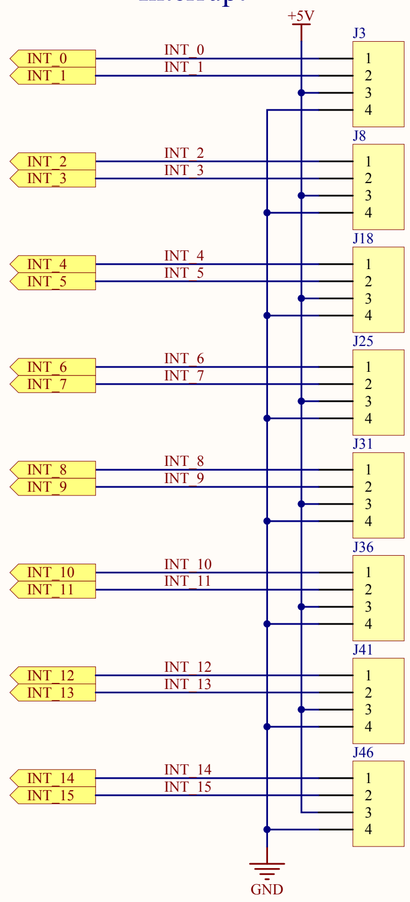


Analog-Digital Converter



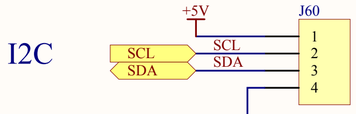
VIN_MEAS - Allows user to select ADC 0 for VIN measurement.

Interrupt

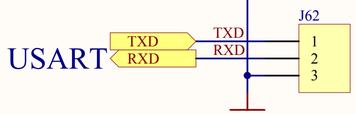


SPI

I2C

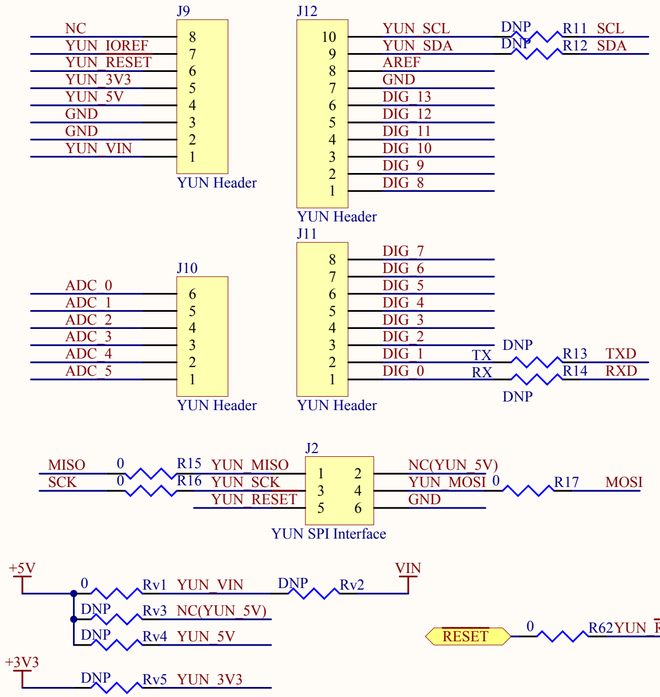


USART



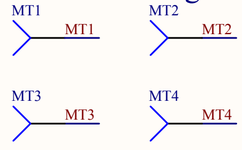
PREC040SFAN-RC Potential Part number for "YUN connectors" which will now be the breakaway, 0.1" spacing male headers since the YUN board will be mounted upside down/inverted. (0.416" tall header, resulting in a 0.499" mating height)

YUN Connectors



INITIAL NOTES ONLY (will be revised once exact desired function is identified, this config provides options)
Rv1 - use as 1 option for getting 5V/VIN into the YUN, do not connect any other RvX
Rv2 - use when not using the YUN (parallel 5 & 3.3 generated) do not connect any other RvX
Rv3 - use as 1 option for getting 5V into the YUN, do not connect any other RvX
Rv4 & Rv5 - use when not using the YUN (single 5 & 3.3 generated) do not connect any other RvX

Board Mounting Holes



Connectors		
Size: B	Date: 6/13/2014	Revision: 1.0
Engineer: K. Chambles		Sheet: 5 of 5
Drawn By: K. Chambles		

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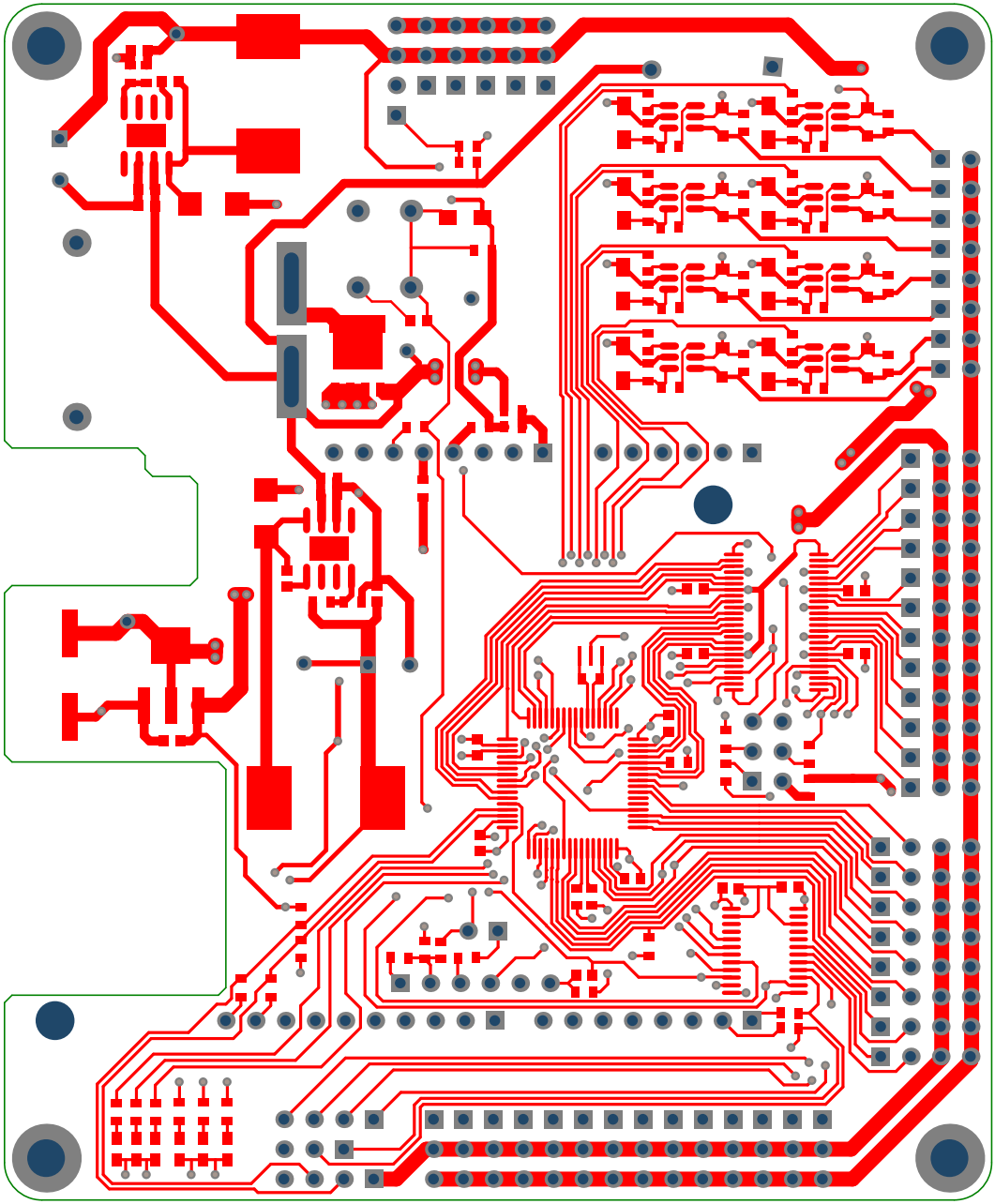

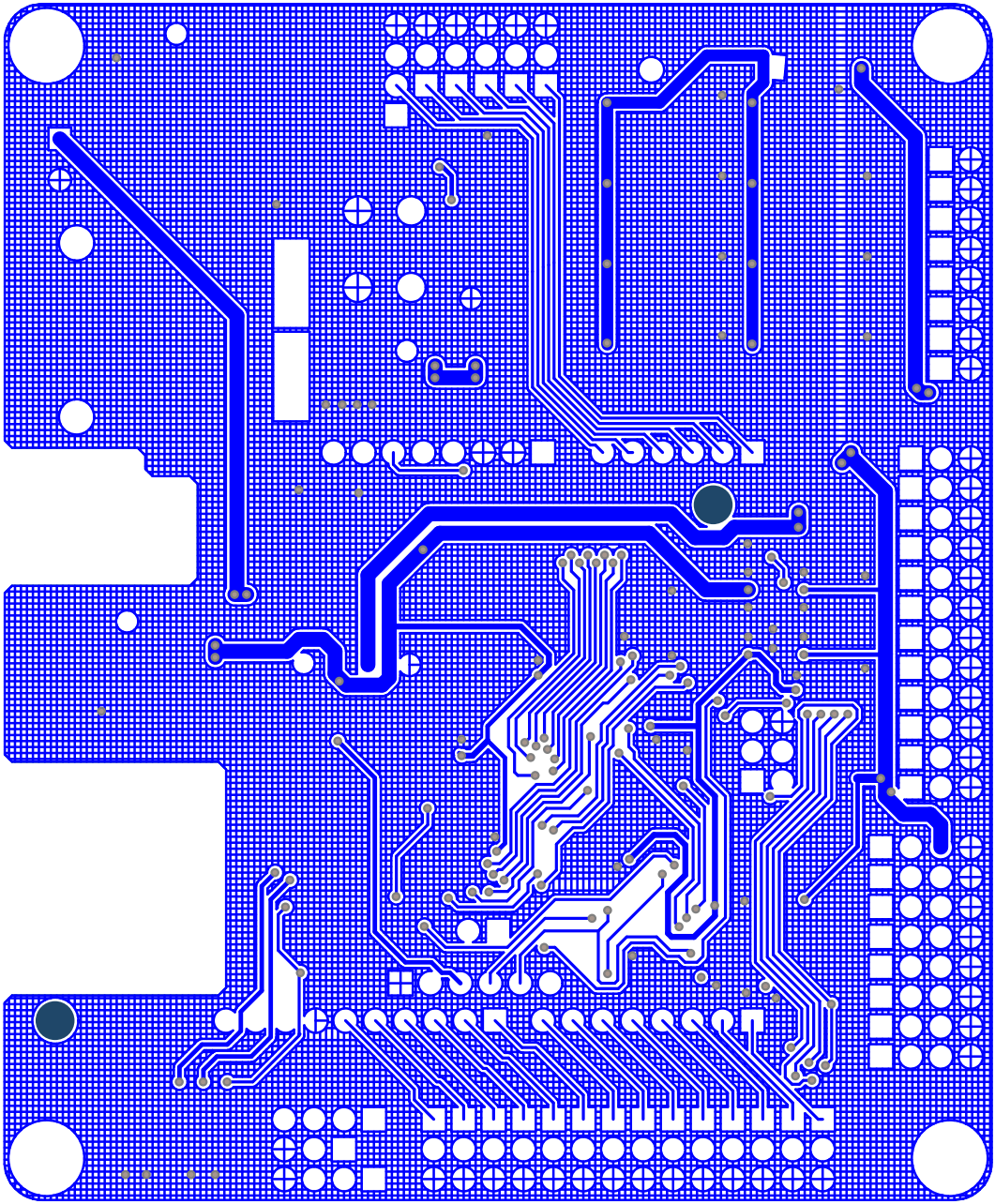

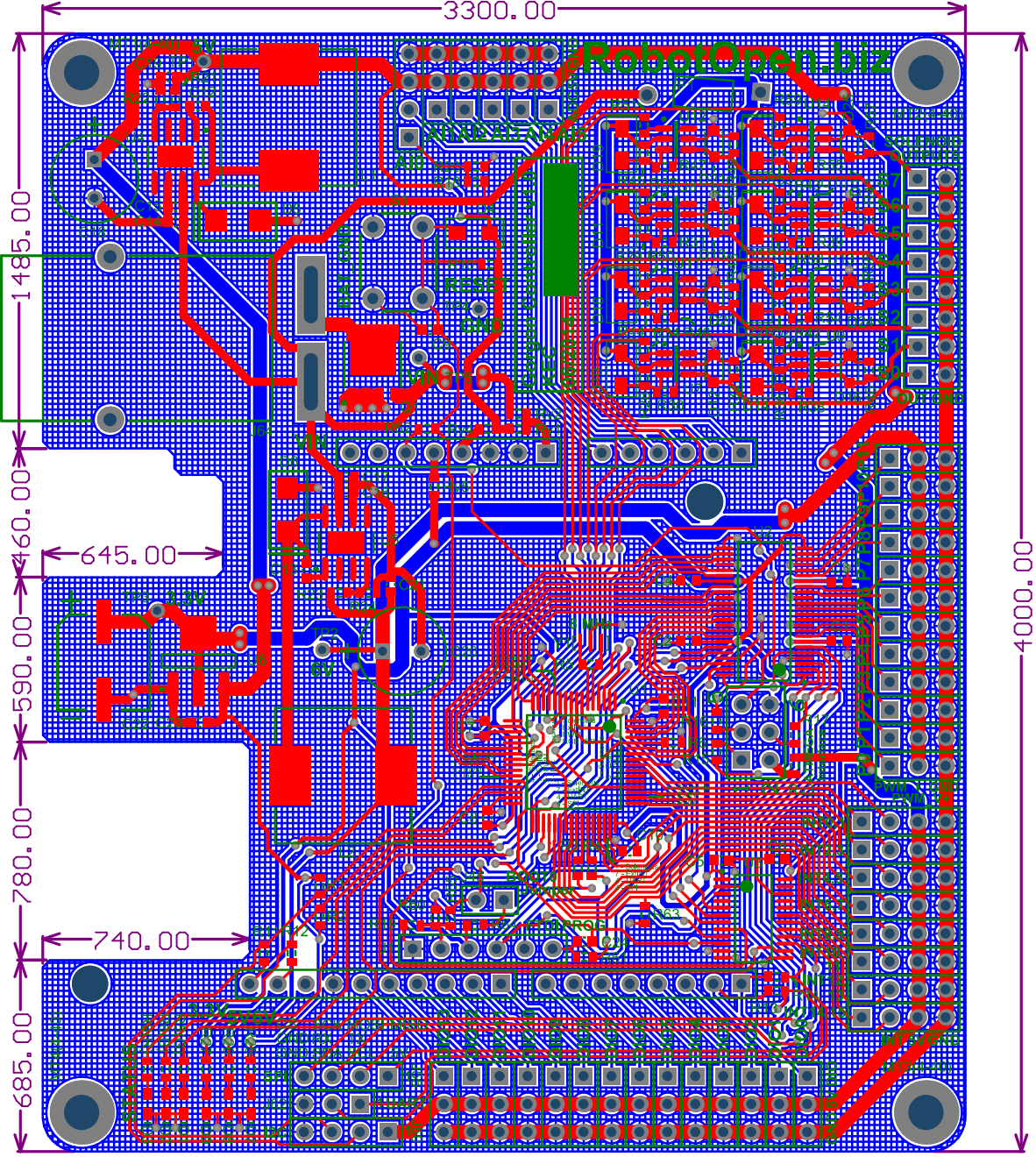
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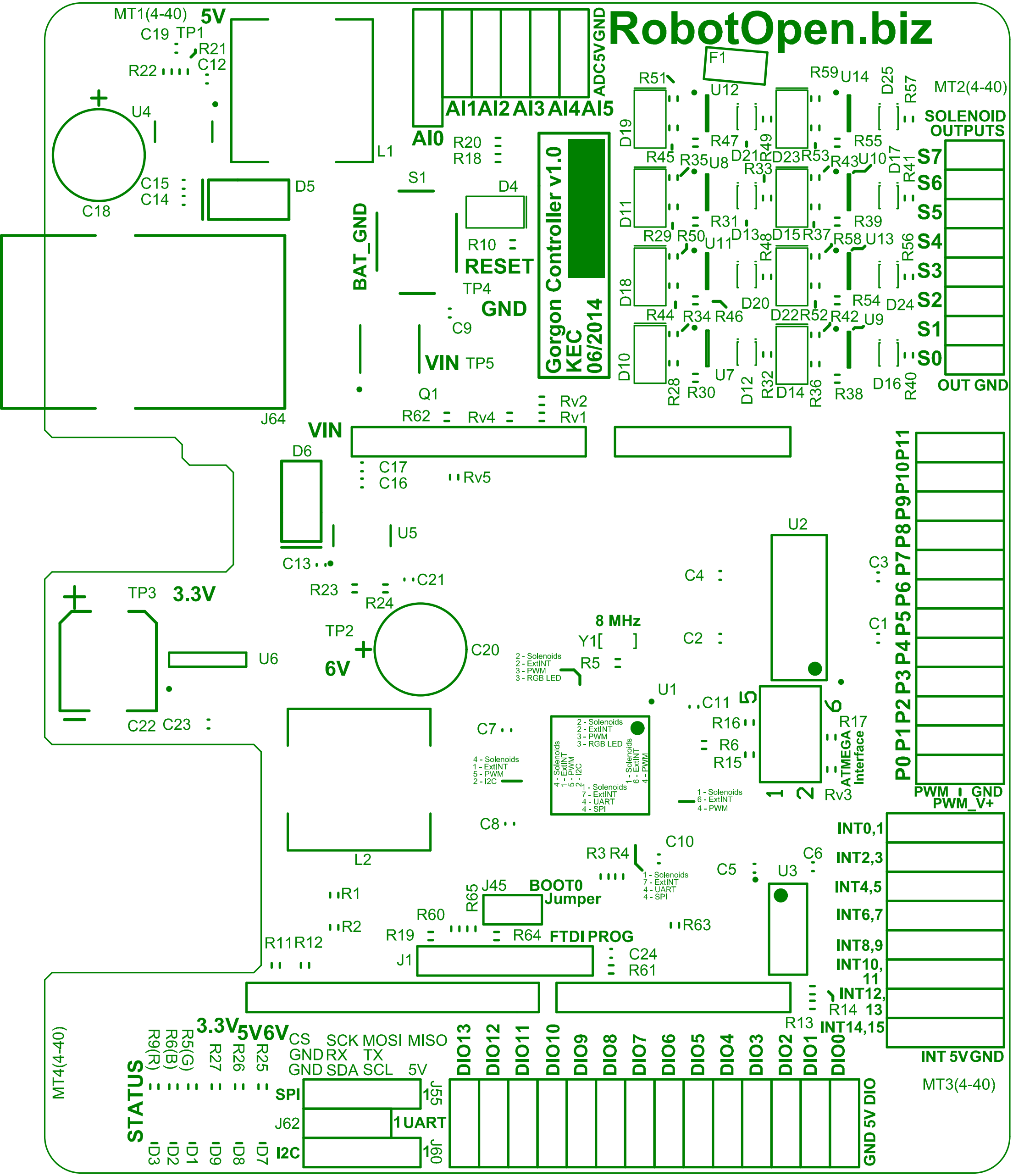

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Gorgon Controller v1.0
KEC
06/2014
SOLENOID OUTPUTS
S7
S6
S5
S4
S3
S2
S1
S0
OUT GND
AI0 AI1 AI2 AI3 AI4 AI5
ADC 5V GND
5V
3.3V
6V
VIN
RESET
GND
BAT_GND
8 MHz
BOOT0 Jumper
FTDI PROG
ATMEGA Interface
P0 P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11
PWM GND
PWM_V+
INT0,1
INT2,3
INT4,5
INT6,7
INT8,9
INT10, 11
INT12, 13
INT14,15
INT 5V GND
DIO13 DIO12 DIO11 DIO10 DIO9 DIO8 DIO7 DIO6 DIO5 DIO4 DIO3 DIO2 DIO1 DIO0
GND 5V DIO
STATUS
SPI
UART
I2C
CS SCK MOSI MISO
GND RX TX
GND SDA SCL 5V
MT1(4-40)
MT2(4-40)
MT3(4-40)
MT4(4-40)