IC1
TMS320F28034PNT

Left pins		
GPIO0	69	GPIO0/EPWM1A
GPIO1	68	GPIO1/EPWM1B/COMP1OUT
	67	GPIO2/EPWM2A
	66	GPIO3/EPWM2B/SPISOMIA/COMP2OUT
	63	GPIO4/EPWM3A
GPIO5	62	GPIO5/EPWM6B/LINRXA/HRCAP2
GPIO6	50	GPIO6/EPWM4A/EPWMSYNCI/EPWMSYNCO
SERIAL-RX	49	GPIO7/EPWM4B/SCIRXDA
GPIO8	43	GPIO8/EPWM5A/ADCSOCAO
GPIO9	39	GPIO9/EPWM5B/LINTXA/HRCAP1
	65	GPIO10/EPWM6A/ADCSOCBO
GPIO11	61	GPIO11/EPWM6B/LINRXA/HRCAP2
SERIAL-TX	47	↑GPIO12/TZ1/SCITXDA/SPISOMIB
SPI_SOMI	76	↑GPIO13/TZ2/SPISOMIB
SPI_CLK	77	↑GPIO14/TZ3/LINTXA/SPICLKB
SPI_CS	75	↑GPIO15/TZ1/LINRXA/SPISTEB
	46	↑GPIO16/SPISOMIA/TZ2
	42	↑GPIO17/SPISOMIA/TZ3
GPIO18	41	↑GPIO18/SPICLKA/LINTXA/XCLKOUT
	55	↑GPIO19/XCLKIN/SPISTEA/LINRXA/ECAP1
12V_SW_CTRL	78	↑GPIO20/EQEP1A/COMP1OUT
	79	↑GPIO21/EQEP1B/COMP2OUT
GPIO22	1	↑GPIO22/EQEP1S/LINTXA
GPIO23	4	↑GPIO23/EQEP1I/LINRXA
SPI_SIMO	80	↑GPIO24/ECAP1/SPISIMOB
GPIO25	44	↑GPIO25/SPISOMIB
GPIO26	37	↑GPIO26/HRCAP1/SPICLKB
GPIO27	31	↑GPIO27/HRCAP2/SPISTEB
SERIAL_RX/I2C_SDA	40	↑GPIO28/SCIRXDA/SDAA/TZ2
SERIAL_TX/I2C_SCL	34	↑GPIO29/SCITXDA/SCLA/TZ3

Right pins		
GPIO30/CANRXA↑	33	CAN-RX
GPIO31/CANTXA↑	32	CAN-TX
GPIO32/SDAA/EPWMSYNCI/ADCSOCAO↑	2	SDA
GPIO33/SCLA/EPWMSYNCO/ADCSOCBO↑	3	SCL
GPIO34/COMP2OUT/COMP3OUT↑	74	GPIO34
GPIO35/TDI↑	59	TDI
GPIO36/TMS↑	60	TMS
GPIO37/TDO↑	58	TDO
GPIO38/TCK/XCLKIN↑	57	TCK
GPIO39↑	56	
GPIO40/EPWM7A↑	64	
GPIO41/EPWM7B↑	48	
GPIO42/COMP1OUT↑	5	GPIO42
GPIO43/COMP42OUT↑	6	GPIO43
GPIO44↑	45	
ADCINA0	18	ADCINA0
ADCINA1	17	ADCINA1
ADCINA2/COMP1A/AIO2	16	ADCINA2
ADCINA3	15	ADCINA3
ADCINA4/COMP2A/AIO4	14	ADCINA4
ADCINA5	13	ADCINA5
ADCINA6/COMP3A/AIO6	12	PWROUT_INT
ADCINA7	11	ADCINA7
ADCINB0	23	ADCINB0
ADCINB1	24	ADCINB1
ADCINB2/COMP1B/AIO10	25	ADCINB2
ADCINB3	26	ADCINB3
ADCINB4/COMP2B/AIO12	27	ADCINB4
ADCINB5	28	
ADCINB6/COMP3B/AIO14	29	ADCINB6
ADCINB7	30	ADCINB7
VREFHI	19	
VREFLO	22	
XRS	9	XRS
TRST	10	TRST
X1	52	
X2	51	
VREGENZ	73	GND
TEST2	38	

Power pins		
	8	VSS
	35	VSS
	53	VSS
	71	VSS
	21	VSSA
	20	VDDA
	7	VDD
	54	VDD
	72	VDD
	36	VDDIO
	70	VDDIO

GND

+3V3
L4
BLM21PG221SN1D

L3 choke here

C1
2.2 uF
C4 C3 C2
GND GND

L2
L5
+3V3
BKP2125HS600-T
C6 C5
GND

↑ symbol indicates pin is pulled up at boot

TODO: choose new pin for LED1
CHANGE: MOVE GP_BUTTON TO GPIO11

TODO: choose new pin for GP_BUTTON

TODO: choose new pin for LED0
TODO: choose new pin for CAN_RESET
or delete
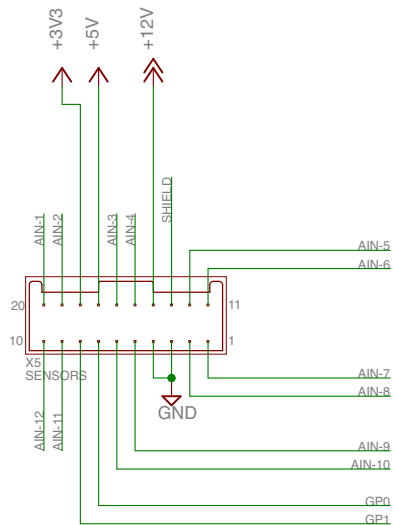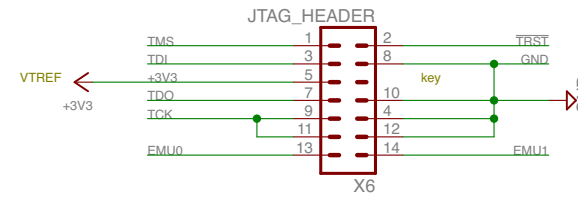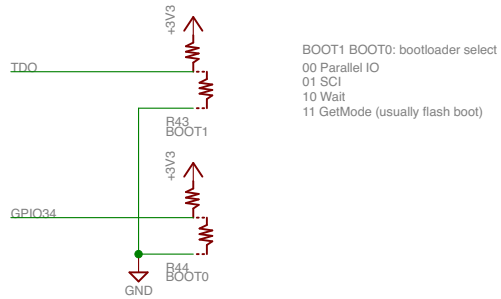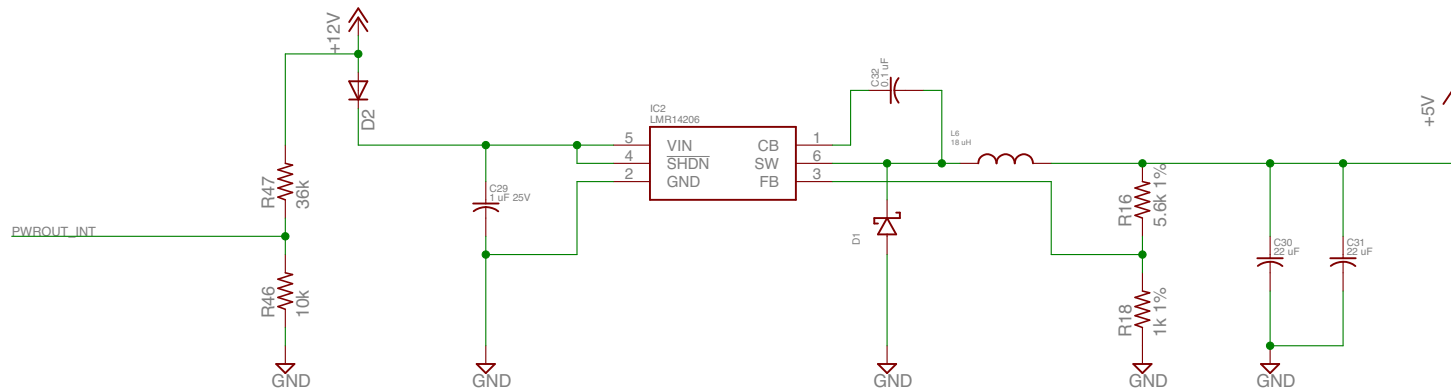
+3V3

GND

DRAFT
F28035 power and signal connections

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: DRAFT
Last modified date: 11/30/14 7:30 PM

TDO

+3V3

BOOT1 BOOT0: bootloader select
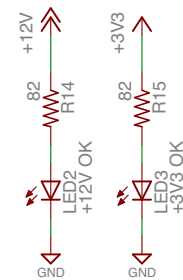00 Parallel IO
01 SCI
10 Wait
11 GetMode (usually flash boot)

R43
BOOT1

+3V3

GPIO34

R44
BOOT0

GND

JTAG_HEADER

TMS	1	2	TRST
TDI	3	8	GND
+3V3	5	key	
VTREF			GND
+3V3	TDO	7	10
TCK	9	4	
	11	12	
EMU0	13	14	EMU1

X6

+3V3   +5V   +12V

SHIELD

AIN-1
AIN-2
AIN-3
AIN-4

AIN-5
AIN-6

20   11

10   1

X5
SENSORS

AIN-7
AIN-8

GND

AIN-12
AIN-11

AIN-9
AIN-10

GP0
GP1

DRAFT

Board: Magic CAN Node
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+12V

D2

R47
36k

R46
10k

PWROUT_INT

C29
1 uF 25V

GND
GND

IC2
LMR14206

5 VIN   CB 1
4 SHDN   SW 6
2 GND   FB 3

C32
0.1 uF

L6
18 uH

D1

R16
5.6k 1%

R18
1k 1%

C30
22 uF

C31
22 uF

+5V

GND
GND
GND
GND

given R2 = 1k
R1 = R2*((5V / 0.765 V) -1)
= 5535.9477
nearest std value 5.6k gives Vout = 5.049 V

TODO: CHECK TOLERANCES

+5V

C14
1 uF 25V

IC3
LP38693-3.3/NOPBMP

4 VIN   VOUT 3
1 VEN

GND 5

C16
1 uF 25V

+3V3

GND
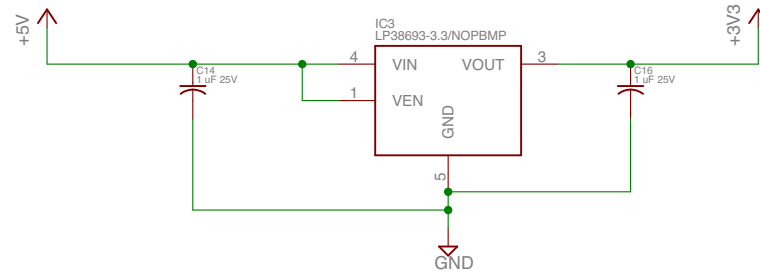
DRAFT
5V and 3V3 power

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: DRAFT
Last modified date: 11/30/14 7:30 PM

+3V3

C17
2.2 uF

GND

GND

+5V

IC9
ISO1050

1	VCC1	VCC2	8
2	RXD	CANH	7
3	TXD	CANL	6
4	GND1	GND2	5

CAN-RX

CAN-TX

GND

GND

D3
SMBJ30CA

SMBJ30CA D4

GND

GND

L7
DR331-513AE

1   4   CANH

2   3   CANL

X7
CAN

GND

CANL

CANH

+12V

GND

SHIELD

CANH

R17
60

SW3-1

C18
4.7 nF

SW3-2

GND

R19
60

CANL
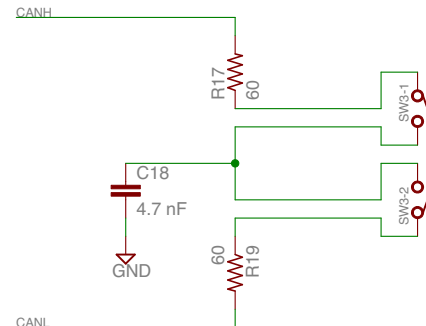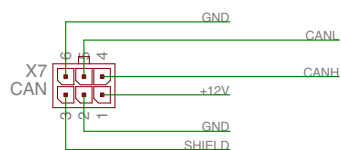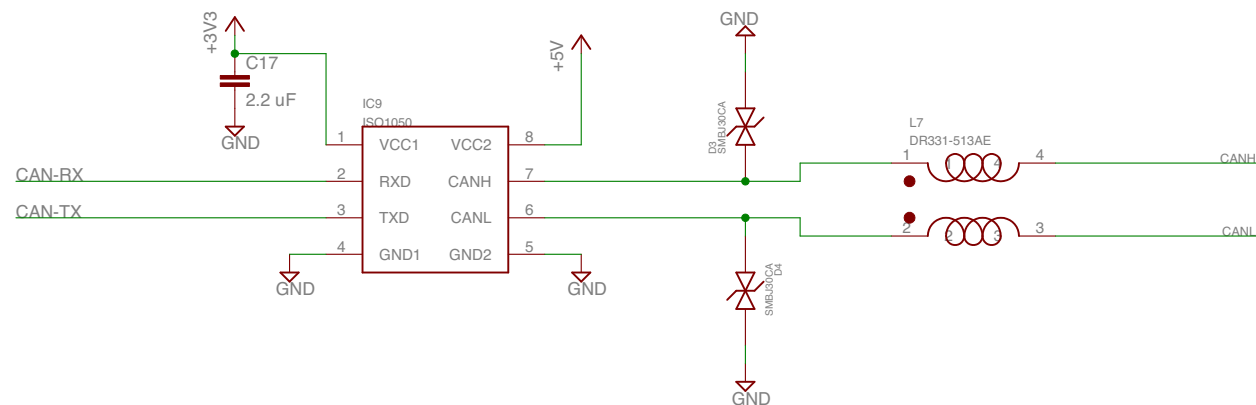
Auxiliary analog input filters

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: DRAFT
Last modified date: 11/30/14 7:30 PM

GP_BUTTON

SW2
IN1

GND

+3V3

82 R36

+3V3

82 R37

LED0
Green

LED1
Yellow

LED0   1   6

LED1   3   4

+12V

82 R14

+3V3

82 R15
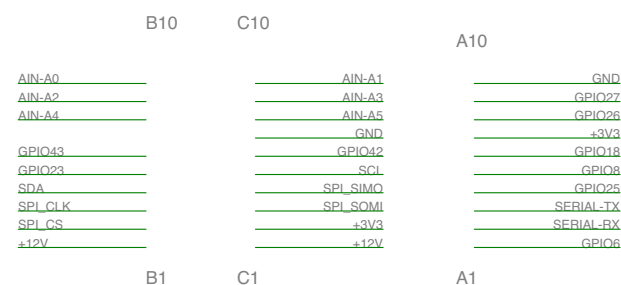
LED2
+12V OK

LED3
+3V3 OK

GND

GND

+3V3

IC5G$3
SN74LVCG207DBV

5   VCC

2   GND

GND
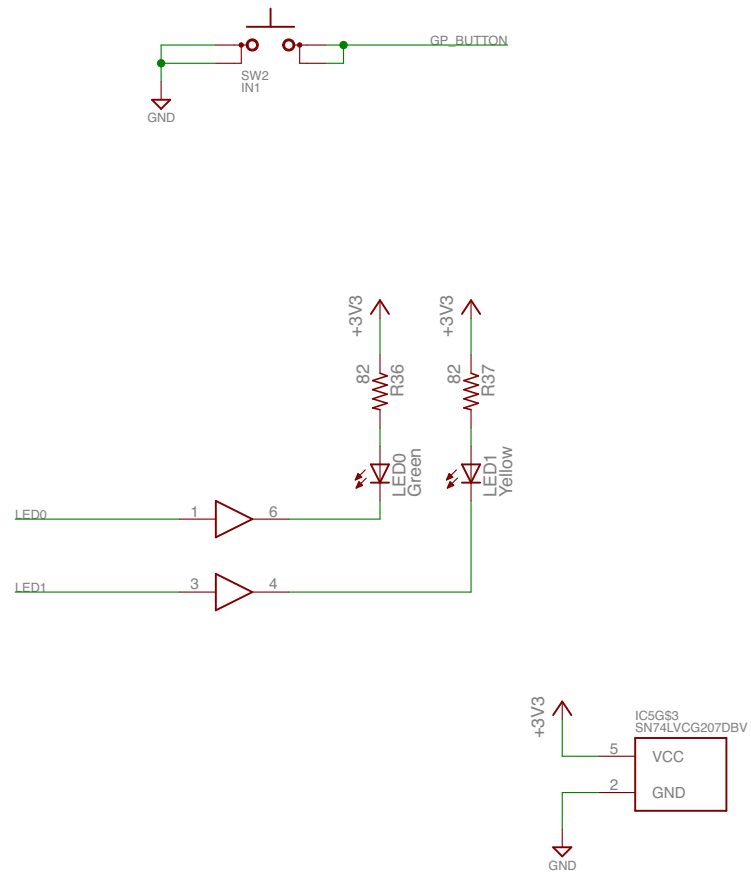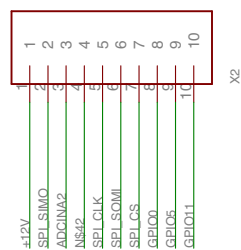
DRAFT
12V switching, LEDs, buttons

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: DRAFT
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Sheet 6/7
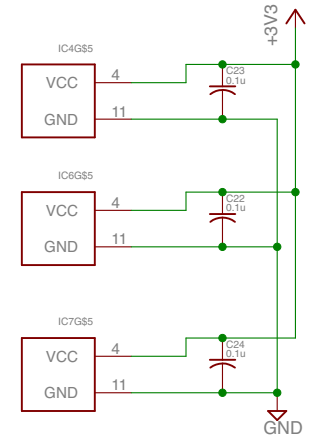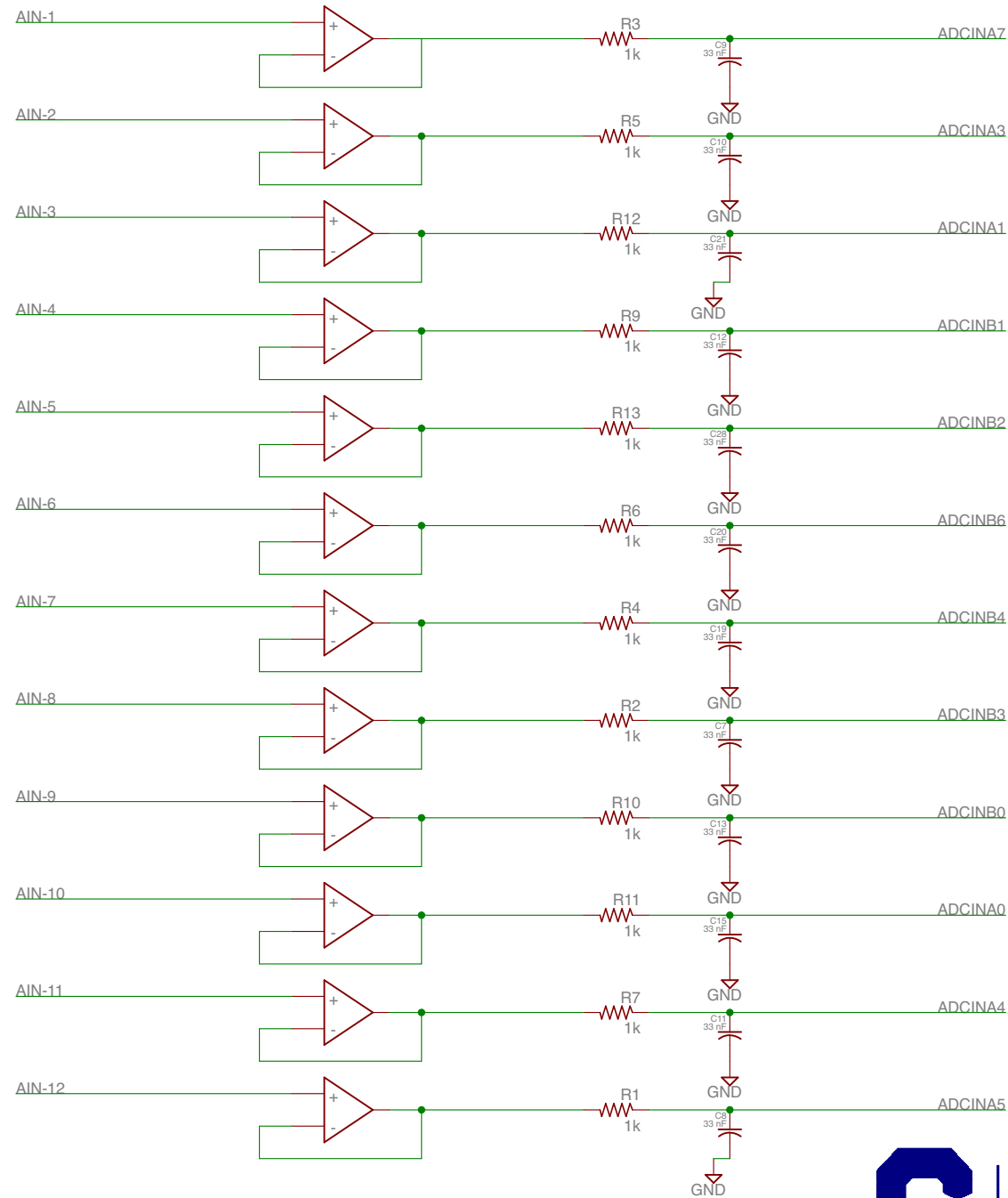
DRAFT
Sensor input filters

Board: Magic CAN Node
Drawn by: Aaron Bonnell-Kangas
Revision date: DRAFT
Last modified date: 11/30/14 7:30 PM

B10   C10

A10

AIN-A0	AIN-A1	GND
AIN-A2	AIN-A3	GPIO27
AIN-A4	AIN-A5	GPIO26
	GND	+3V3
GPIO43	GPIO42	GPIO18
GPIO23	SCL	GPIO8
SDA	SPI_SIMO	GPIO25
SPI_CLK	SPI_SOMI	SERIAL-TX
SPI_CS	+3V3	SERIAL-RX
+12V	+12V	GPIO6

B1   C1   A1

X2

1 2 3 4 5 6 7 8 9 10

+12V
SPI_SIMO
ADCINA2
N&42
SPI_CLK
SPI_SOMI
SPI_CS
GPIO0
GPIO5
GPIO11

NOTE: these symbols are wrong presently
   SV3(1-10) is A1-A10
   SV2(2,4,6,8,...) is B1-10
   SV2(1,3,5,9,...) is C1-10

X1

1 2 3 4 5 6 7 8 9 10

ADCINBZ
SHIELD
SERIAL_TX/I2C_SCL
N&2Z
GPIO9
SERIAL_RX/I2C_SDA
+3V3
+5V
GND

DRAFT
Sensor connector and backpack headers

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: DRAFT
Last modified date: 11/30/14 7:30 PM