c

CHANGE: I2C pins on backpack header are different

IC1
TMS320F28034PNT

CHANGE: GP_BUTTON is now on GPIO4

CHANGE: MOVE GP_BUTTON TO GPIO11

CHANGE: remove 12V_SW_CTRL
CHANGE: LED0 is now on GPIO22
CHANGE: LED1 is now on GPIO23
CHANGE: CAN_RESET is deleted

Pin	Signal		Signal	Pin	Net
69	GPIO0/EPWM1A		GPIO30/CANRXA ↑	33	CAN-RX
68	GPIO1/EPWM1B/COMP1OUT		GPIO31/CANTXA ↑	32	CAN-TX
67	GPIO2/EPWM2A		GPIO32/SDAA/EPWMSYNCI/ADCSOCAO	2	
66	GPIO3/EPWM2B/SPISOMIA/COMP2OUT		GPIO33/SCLA/EPWMSYNCO/ADCSOCBO	3	
63	GPIO4/EPWM3A		GPIO34/COMP2OUT/COMP3OUT ↑	74	GPIO34
62	GPIO5/EPWM6B/LINRXA/HRCAP2		GPIO35/TDI ↑	59	TDI
50	GPIO6/EPWM4A/EPWMSYNCI/EPWMSYNCO		GPIO36/TMS ↑	60	TMS
49	GPIO7/EPWM4B/SCIRXDA		GPIO37/TDO ↑	58	TDO
43	GPIO8/EPWM5A/ADCSOCAO		GPIO38/TCK/XCLKIN ↑	57	TCK
39	GPIO9/EPWM5B/LINTXA/HRCAP1		GPIO39	56	
65	GPIO10/EPWM6A/ADCSOCBO		GPIO40/EPWM7A ↑	64	
61	GPIO11/EPWM6B/LINRXA/HRCAP2		GPIO41/EPWM7B ↑	48	
47	↑ GPIO12/TZ1/SCITXDA/SPISOMIB		GPIO42/COMP1OUT ↑	5	
76	↑ GPIO13/TZ2/SPISOMIB		GPIO43/COMP42OUT ↑	6	
77	↑ GPIO14/TZ3/LINTXA/SPICLKB		GPIO44 ↑	45	
75	↑ GPIO15/TZ1/LINRXA/SPISTEB		ADCINA0	18	ADCINA0
46	↑ GPIO16/SPISOMIA/TZ2		ADCINA1	17	ADCINA1
42	↑ GPIO17/SPISOMIA/TZ3		ADCINA2/COMP1A/AIO2	16	ADCINA2
41	↑ GPIO18/SPICLKA/LINTXA/XCLKOUT		ADCINA3	15	ADCINA3
55	↑ GPIO19/XCLKIN/SPISTEA/LINRXA/ECAP1		ADCINA4/COMP2A/AIO4	14	ADCINA4
78	↑ GPIO20/EQEP1A/COMP1OUT		ADCINA5	13	ADCINA5
79	↑ GPIO21/EQEP1B/COMP2OUT		ADCINA6/COMP3A/AIO6	12	PWROUT_INT
1	↑ GPIO22/EQEP1S/LINTXA		ADCINA7	11	ADCINA7
4	↑ GPIO23/EQEP1I/LINRXA		ADCINB0	23	ADCINB0
80	↑ GPIO24/ECAP1/SPISIMOB		ADCINB1	24	ADCINB1
44	↑ GPIO25/SPISOMIB		ADCINB2/COMP1B/AIO10	25	ADCINB2
37	↑ GPIO26/HRCAP1/SPICLKB		ADCINB3	26	ADCINB3
31	↑ GPIO27/HRCAP2/SPISTEB		ADCINB4/COMP2B/AIO12	27	ADCINB4
40	↑ GPIO28/SCIRXDA/SDAA/TZ2		ADCINB5	28	
34	↑ GPIO29/SCITXDA/SCLA/TZ3		ADCINB6/COMP3B/AIO14	29	ADCINB6
			ADCINB7	30	ADCINB7

GPIO0
GP_BUTTON
GPIO5
GPIO9
GPIO11
SPI_SOMI
SPI_CLK
SPI_CS
GP1
GPIO20
LED0
SPI_SIMO
GP0
SERIAL_RX/I2C_SDA
SERIAL_TX/I2C_SCI

Pin		
8	VSS	
35	VSS	
53	VSS	
71	VSS	

GND

| 19 | VREFHI | +3V3 |
| 22 | VREFLO | GND |

GND

L3 choke here 21 VSSA

| 9 | XRS | XRS |
| 10 | TRST | TRST |

+3V3
L4
BLM21PG221SN1D

20 VDDA

7	VDD
54	VDD
72	VDD

C1
2.2 uF

C4 C3 C2

| 52 | X1 |
| 51 | X2 |

L2
L5
+3V3
BKP2125HS600-T

36 VDDIO
70 VDDIO

73 VREGENZ GND

38 TEST2

C6 C5

GND   GND   GND
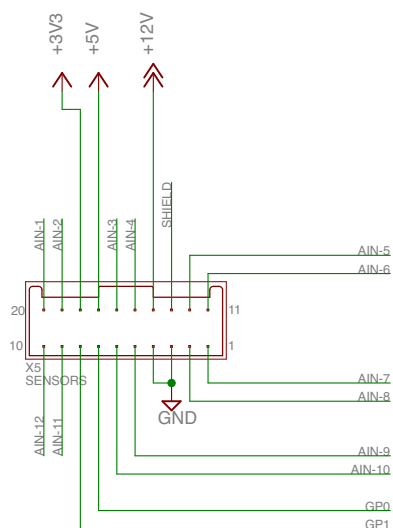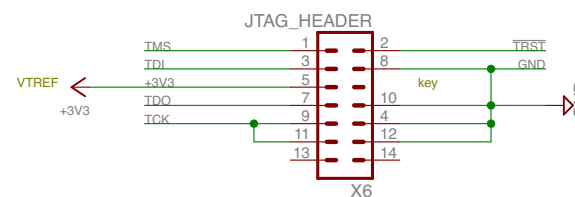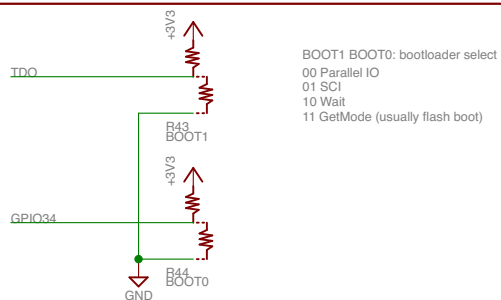
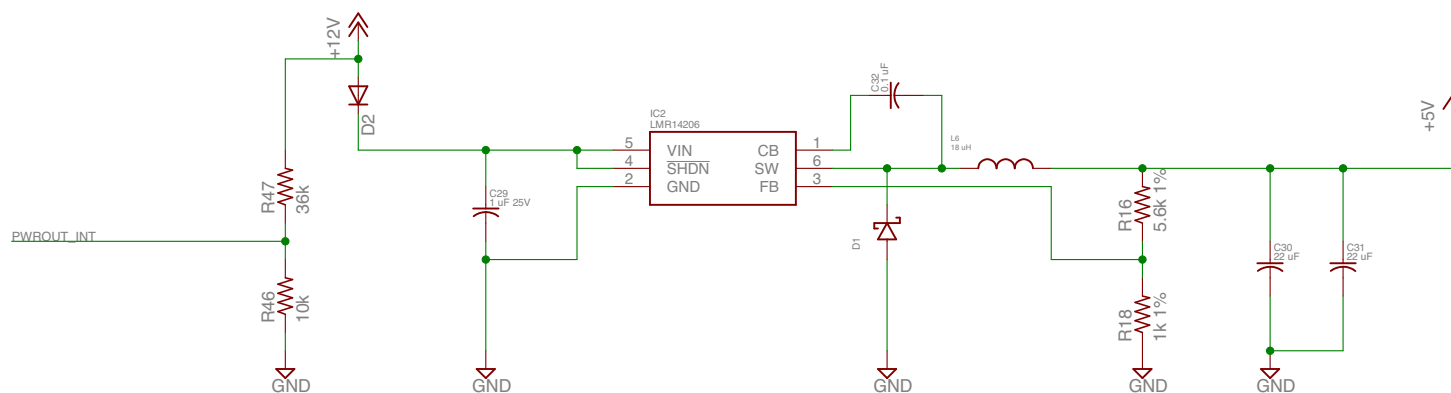↑ symbol indicates pin is pulled up at boot

RELEASE
F28035 power and signal connections

Board: Magic CAN Node
Drawn by Aaron Bonnell-Kangas
Revision date: v2.1.0 - 2015-04-07
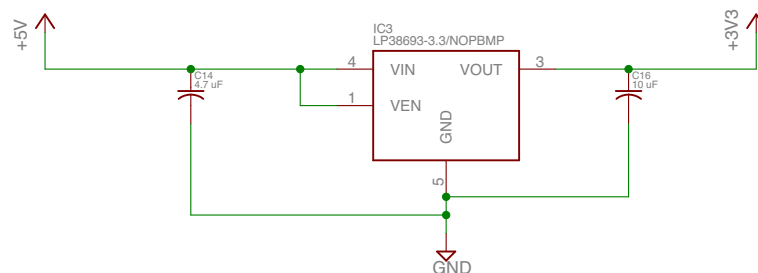Last modified date: 4/7/15 2:24 PM

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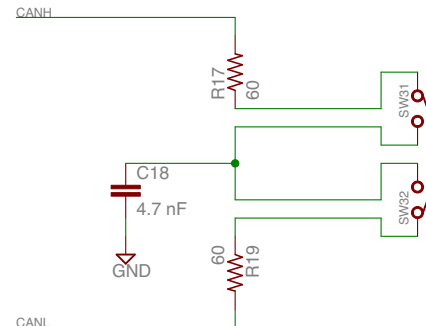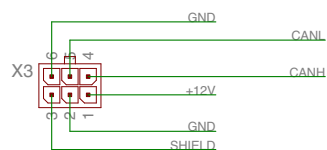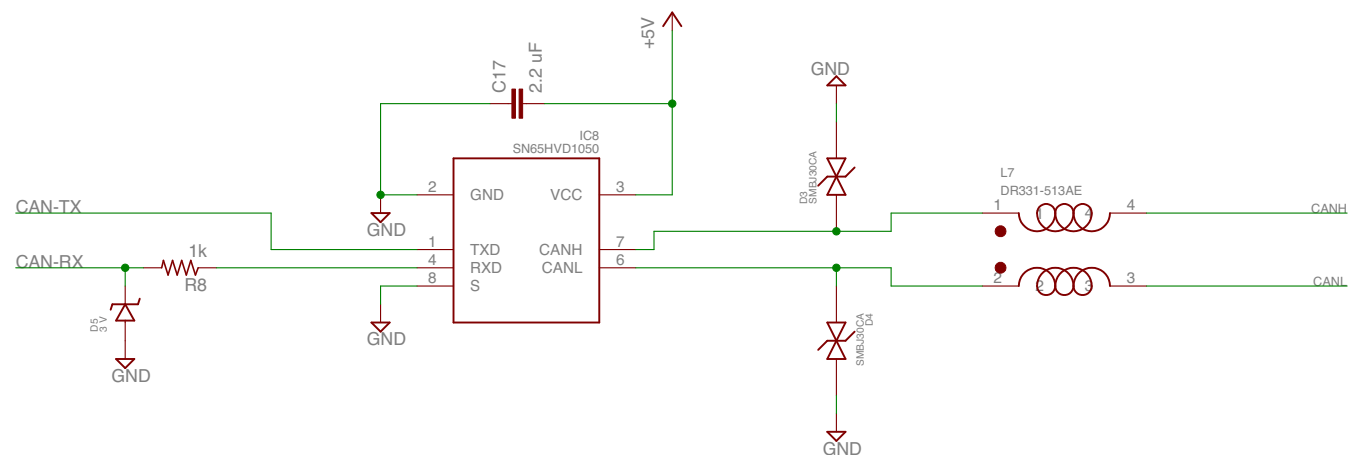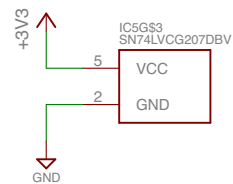00 Parallel IO
01 SCI
10 Wait
11 GetMode (usually flash boot)

+3V3

TDO

R43
BOOT1

+3V3

GPIO34

R44
BOOT0

GND

JTAG_HEADER

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

+3V3

X6

GND

+3V3 +5V +12V

SHIELD

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

AIN-5
AIN-6

20   11

10   1
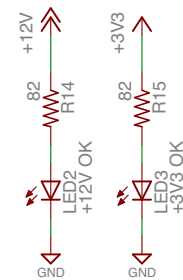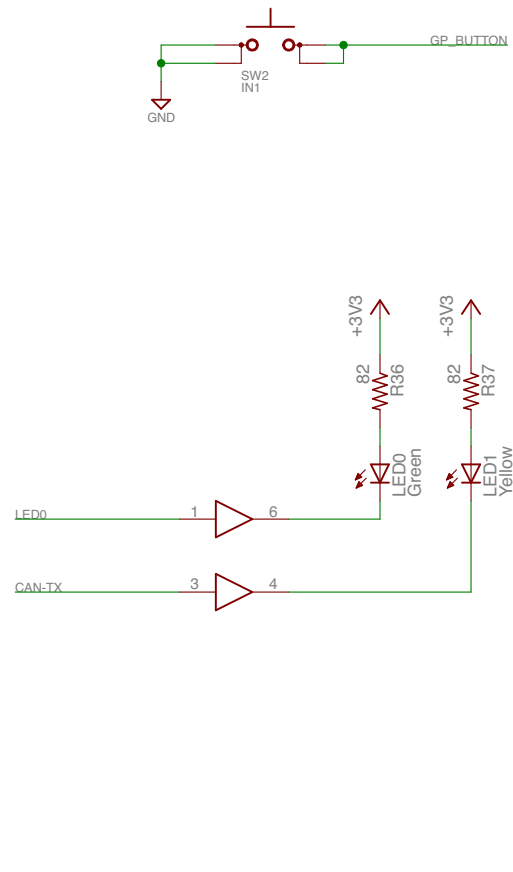
X5
SENSORS

AIN-7
AIN-8

GND

AIN-12
AIN-11

AIN-9
AIN-10

GP0
GP1

RELEASE

Board: Magic CAN Node
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+12V

D2

R47
36k

PWROUT_INT

R46
10k

GND

C29
1 uF 25V

GND

IC2
LMR14206

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

GND

C32
0.1 uF

L6
18 uH

D1

GND

R16
5.6k 1%

R18
1k 1%

GND

C30
22 uF

C31
22 uF

GND

+5V

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

+5V

C14
4.7 uF

IC3
LP38693-3.3/NOPBMP

4 VIN   VOUT 3
1 VEN
          GND
           5

C16
10 uF

+3V3

GND

RELEASE
5V and 3V3 power
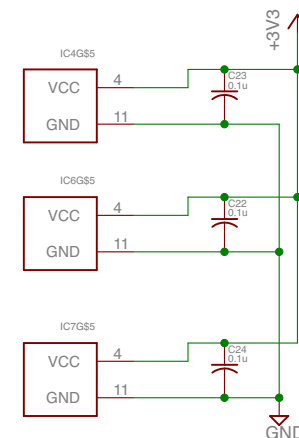
Board: Magic CAN Node
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Last modified date: 4/7/15 2:24 PM

CAN-TX

CAN-RX

1k
R8

D5
3 V

GND

C17
2.2 uF

+5V

IC8
SN65HVD1050

2	GND	VCC	3
1	TXD	CANH	7
4	RXD	CANL	6
8	S		

GND

GND

GND

D3
SMBJ30CA

GND

SMBJ30CA D4

GND

L7
DR331-513AE

| 1 | | 4 | CANH |
| 2 | | 3 | CANL |

GND

CANL

CANH

+12V

GND

SHIELD

X3

CANH

R17
60

SW31

C18

4.7 nF

GND

60 R19

SW32

CANL

GP_BUTTON

SW2
IN1

GND

+3V3

82 R36

+3V3

82 R37

LED0
Green

LED1
Yellow

+12V

82 R14

+3V3

82 R15

LED2
+12V OK

LED3
+3V3 OK

GND

GND

LED0

1   6

CAN-TX

3   4

+3V3

IC5G$3
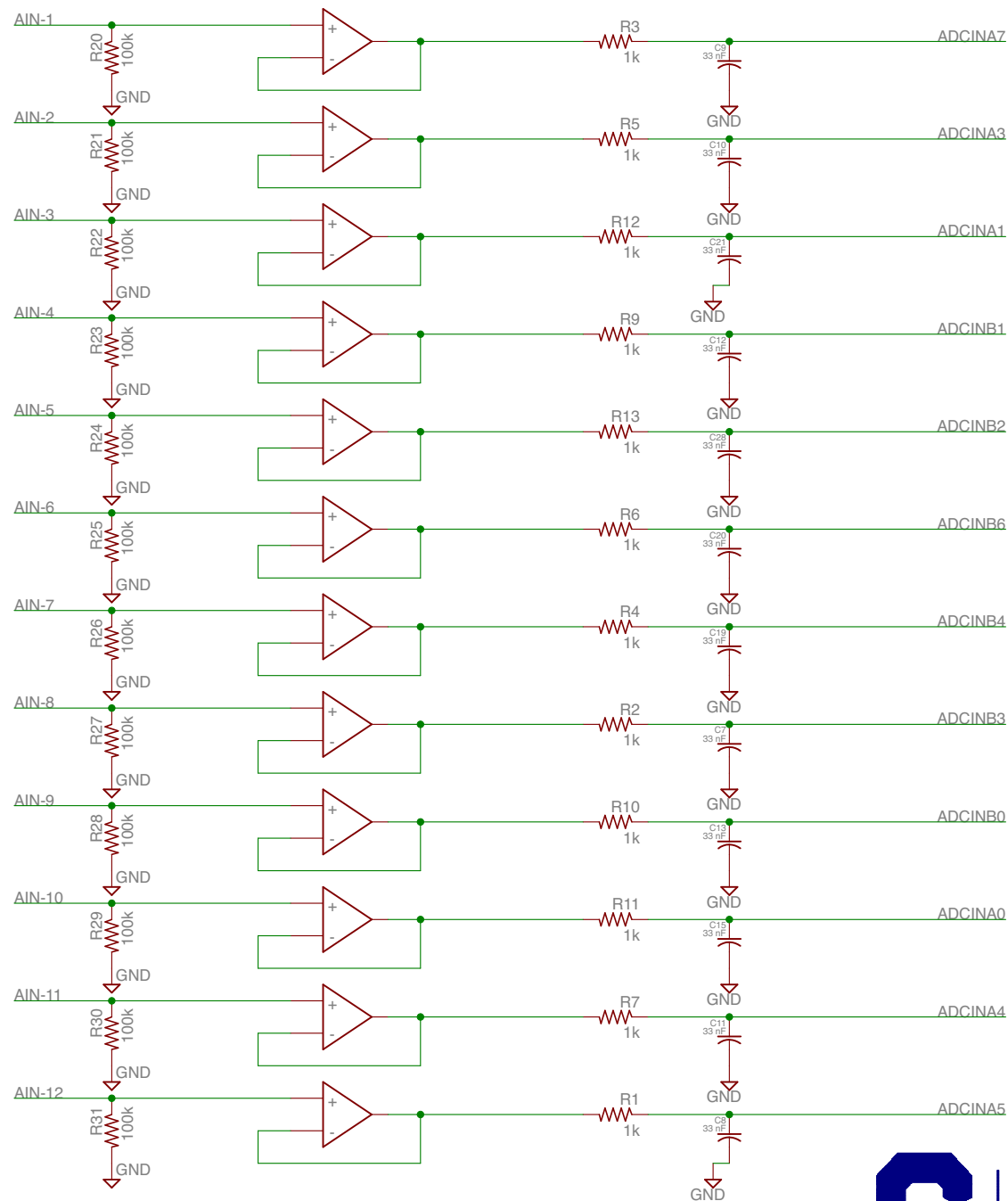SN74LVCG207DBV

5   VCC

2   GND

GND

RELEASE
12V switching, LEDs, buttons
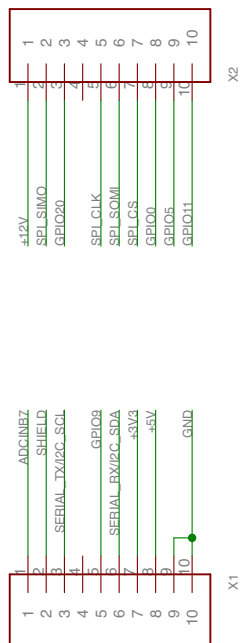
Board: Magic CAN Node
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Last modified date: 4/7/15 2:24 PM

AIN-1

R20 100k

GND

+
−

R3 1k

C9 33 nF

GND

ADCINA7

AIN-2

R21 100k

GND

+
−

R5 1k

C10 33 nF

GND

ADCINA3

AIN-3

R22 100k

GND

+
−

R12 1k

C21 33 nF

GND

ADCINA1

AIN-4

R23 100k

GND

+
−

R9 1k

C12 33 nF

GND

ADCINB1

AIN-5

R24 100k

GND

+
−

R13 1k

C28 33 nF

GND

ADCINB2

AIN-6

R25 100k

GND

+
−

R6 1k

C20 33 nF

GND

ADCINB6

AIN-7

R26 100k

GND

+
−

R4 1k

C19 33 nF

GND

ADCINB4

AIN-8

R27 100k

GND

+
−

R2 1k

C7 33 nF

GND

ADCINB3

AIN-9

R28 100k

GND

+
−

R10 1k

C13 33 nF

GND

ADCINB0

AIN-10

R29 100k

GND

+
−

R11 1k

C15 33 nF

GND

ADCINA0

AIN-11

R30 100k

GND

+
−

R7 1k

C11 33 nF

GND

ADCINA4

AIN-12

R31 100k

GND

+
−

R1 1k

C8 33 nF

GND

ADCINA5

+3V3

IC4G$5
VCC   4
GND   11

C23 0.1u

IC6G$5
VCC   4
GND   11

C22 0.1u

IC7G$5
VCC   4
GND   11

C24 0.1u

GND

RELEASE
Sensor input filters

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X2

1
2
3
4
5
6
7
8
9
10

±12V
SPI_SIMO
GPIO20

SPI_CLK
SPI_SOMI
SPI_CS
GPIO0
GPIO5
GPIO11

X1

ADCINB7
SHIELD
SERIAL_TX/I2C_SCL
GPIO9
SERIAL_RX/I2C_SDA
+3V3
+5V
GND

1
2
3
4
5
6
7
8
9
10

RELEASE
Sensor connector and backpack headers

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