# ruSEfi

## 176122-6_2ND P99A

1A 1B 1C 1D 1E 1F 1G 1H 1J 1K 1L 1M 1N 1O 1P 1Q 1R 1S 1T 1U 1V

W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22

12V-CONST
12V-SWITCH
START-SIG
DIAG
MUL
HL1
HL3
HL2
HL5
AC-RELAY
DIAG-1/4
HL6
HL4
TPS-IDL-SW
STOP-LIGHT
STEERING-SW
AC-SW
COOL-FAN
BLOWER-SW
REAR-DEFROSTER-SW
HEADLIGHT-SW
NEUTRAL-CLUTCH-SW

## 176122-6_2ND P99B

2A 2B 2C 2D 2E 2F 2G 2H 2J 2K 2L 2M 2N 2O 2P

W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38

CRK2+
CRK2-
CAM+
CAM-
2E
2F
KNOCK-INPUT-1
KNOCK-INPUT-2
2J
2K
CANH
CANL
INJ-04
INJ-03
INJ-02
INJ-01_2

## 176122-6_2ND P99C

3A 3B 3C 3D 3E 3F 3G 3H 3J 3K 3L 3M 3N 3O 3P 3Q 3R 3S 3T 3U 3V 3W 3X 3Y 3Z

W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64

GND
OUTPUT-GND
CPU-GND
INPUT-GND
AN11-HARN
AN12-HARN
AN9-HARN
AN10-HARN
AN7-HARN
AN8-HARN
5V
AN6-HARN
AN5-HARN
AN4-HARN
AN3-HARN
AN2-HARN
AN1-HARN
3R
INJ-05
INJ-06
INJ-07
INJ-08
INJ-09
INJ-10
INJ-11
INJ-12

## Sheet: PWR_buck_12V_switcher

12V-SWITCH
GND
Vin
GND
5V-REG
5V

pg 9

File: PWR_buck_12V_switcher.sch

## Sheet: stm32f407_board

GND
GND
VDD
GND
PC2
PC1
PA0
PC3
PA2
PA1
PA4
PA3
PA7
PA6
PC5
PC4

5V
3.3V
PE6
PE5
PD7
PC13
PE3
PE4
PE1
PE2
PB9
PE0
PB8
PB7

P23

PB13
PB14
PB15
PB11
PC0
PD4
PB3
PB4
PB5
PC10
PC11

NC-PC15
NC-PC14
NC-PH1
NC-PH0
NC-PA9
NC-PA10
PB2-NC

PA15
PB0
PB1
PC12
PD0
PD1
PD2
PD3
PD5
PD6

PB12
PD15
PD13
PD14
PA14
BOOT0
NC
NRST
PA8
PA13

pg 10

File: stm32f407_board.sch

## Sheet: adc_amp_divider

5V
AN1-HARN
AN2-HARN
AN3-HARN
AN4-HARN
AN5-HARN
AN6-HARN
AN7-HARN
AN8-HARN
AN9-HARN
AN10-HARN
AN11-HARN
AN12-HARN
12V-SWITCH

5V
INP1
INP2
INP3
INP4
INP5
INP6
INP7
INP8
INP9
INP10
INP11
INP12
12V_bat

GND
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OUT9
OUT10
OUT11
OUT12

pg 3

File: adc_amp_divider.sch

## Sheet: DD_HIP9011

5V
GND
KNOCK-INPUT-1
KNOCK-INPUT-2

5V
GND
KNOCK1
KNOCK2
OUT

CS
SCK
SO
SI
INT/HLD

SCK-2
SO-2
SI-2

pg 5

File: DD_HIP9011.sch

## Sheet: mmc_usb_1

5V
3.3V
GND

5V
3.3V
GND

CS_SD_MODULE
SPI_SCK
SPI_MISO
SPI_MOSI

CS_SD
SCK
SO
SI

pg 7

232-FROM-MCU
232-TO-MCU
USART_RX
USART_TX

File: mmc_usb_1.sch

C23 1uF
C24 1uF
3.3V
GND

## U4 ITEAD_HC-0X

VCC
AIO0
AIO1
PIO0
PIO1
PIO2
PIO3
PIO4
PIO5
PIO6
PIO7
PIO8
PIO9
PIO10
PIO11
GND GND GND

RESET
UART_RTS
UART_CTS
UART_RX
UART_TX
SPI_MOSI
SPI_CS
SPI_CLK
SPI_MISO
USB_D-
USB_D+
PCM_CLK
PCM_OUT
PCM_IN
PCM_SYNC

## Sheet: thermocouple1

3.3V
GND
3.3v
GND
SCK
MISO
/CS
SCK
SO

pg 11

File: thermocouple_module.sch

## Sheet: thermocouple2

3.3V
GND
3.3v
GND
SCK
MISO
/CS
SCK
SO

pg 12

File: thermocouple_module.sch

## Sheet: thermocouple3

3.3V
GND
3.3v
GND
SCK
MISO
/CS
SCK
SO

pg 13

File: thermocouple_module.sch

## Sheet: thermocouple4

3.3V
GND
3.3v
GND
SCK
MISO
/CS
SCK
SO

pg 14

File: thermocouple_module.sch

## Sheet: inj_12ch

INJ-01_5V
INJ-02_5V
INJ-03_5V
INJ-04_5V
INJ-05_5V
INJ-06_5V
INJ-07_5V
INJ-08_5V
INJ-09_5V
INJ-10_5V
INJ-11_5V
INJ-12_5V

INJ-01_2
INJ-02
INJ-03
INJ-04
INJ-05
INJ-06
INJ-07
INJ-08
INJ-09
INJ-10
INJ-11
INJ-12
iGND1
iGND2

INJ-01_2
INJ-02
INJ-03
INJ-04
INJ-05
INJ-06
INJ-07
INJ-08
INJ-09
INJ-10
INJ-11
INJ-12
GND
GND

pg 6

File: inj_12ch.sch

## Sheet: hi-lo

PC7
PE14
PC9
PE12
PE8
PE10

H_IN1
H_IN2
H_IN3
H_IN4
H_IN5
H_IN6

HL1
HL2
HL3
HL4
HL5
HL6
GND
12V

HL1
HL2
HL3
HL4
HL5
HL6
GND
12V-SWITCH

pg 2

5V
5V

File: hi-lo.sch

## Sheet: cps_vrs_io_1

PA5
PC6

JP04
JP05

CRANK
5V
GND
CAM

CRANK
5V
GND
CAM

CRK2-
CRK2+
CAM-
CAM+

CRK2-
CRK2+
CAM-
CAM+

pg 8

File: cps_vrs_io_1.sch

## Sheet: can_brd_1

3.3V
GND
PD12
PB6
3.3V
GND
CAN_RX
CAN_TX
CANH
CANL
CANH
CANL

pg 4

File: can_brd_1.sch

The JP1 jumper is needed because we cannot feed the screen via USB — we would need to disconnect it while the board is on a bench

## S1

5V
GND
JP01
2K R99
HD44780_VCC
HD44780_RS
HD44780_CS
HD44780_D4
HD44780_D5
HD44780_D6
HD44780_D7

PE7
PE9
PE11
PE13
PE15
PB10

GND
VCC
VLCD
RS
R/W
CS
D0
D1
D2
D3
D4
D5
D6
D7

A
K
HD44780_VCC
GND

DISPLAY_BL

PC8
PD8
PD10
PD9
PD11

## U5 SKQUCAA010

A
B
C
Center
D
Com
GND

## PROTO AREA

P24 P25 P26 P7 P8 P14

CONN_8X2
CONN_12X2

These two jumpers are here to accomodate stm32f4discovery

These four jumpers are test points

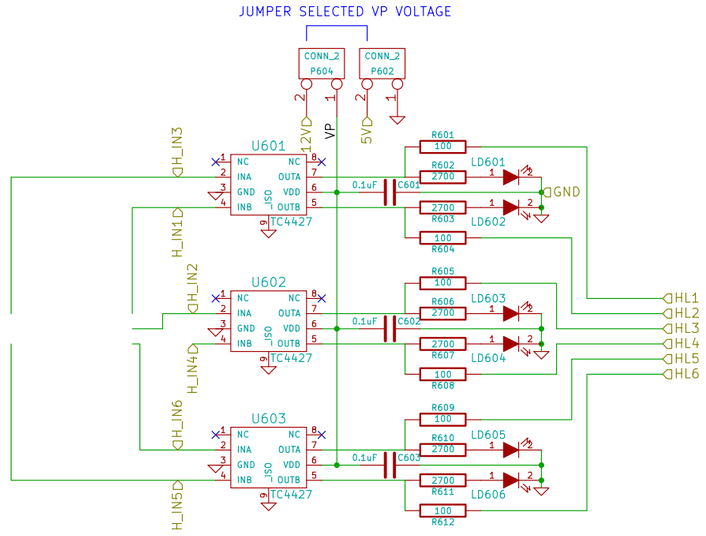
GND GND JP03/JP02
12V-SWITCH GND GND JP07/JP06
5V 5V JP09/JP08
GND 3.3V 3.3V

That's alternative signal OUTPUT — these traces should be routable to PC6 and PA5 via jumpers. Aleternative to W212 and W212 routung of op-amps ch 11 and ch 12

CRANK TEST2 CAM

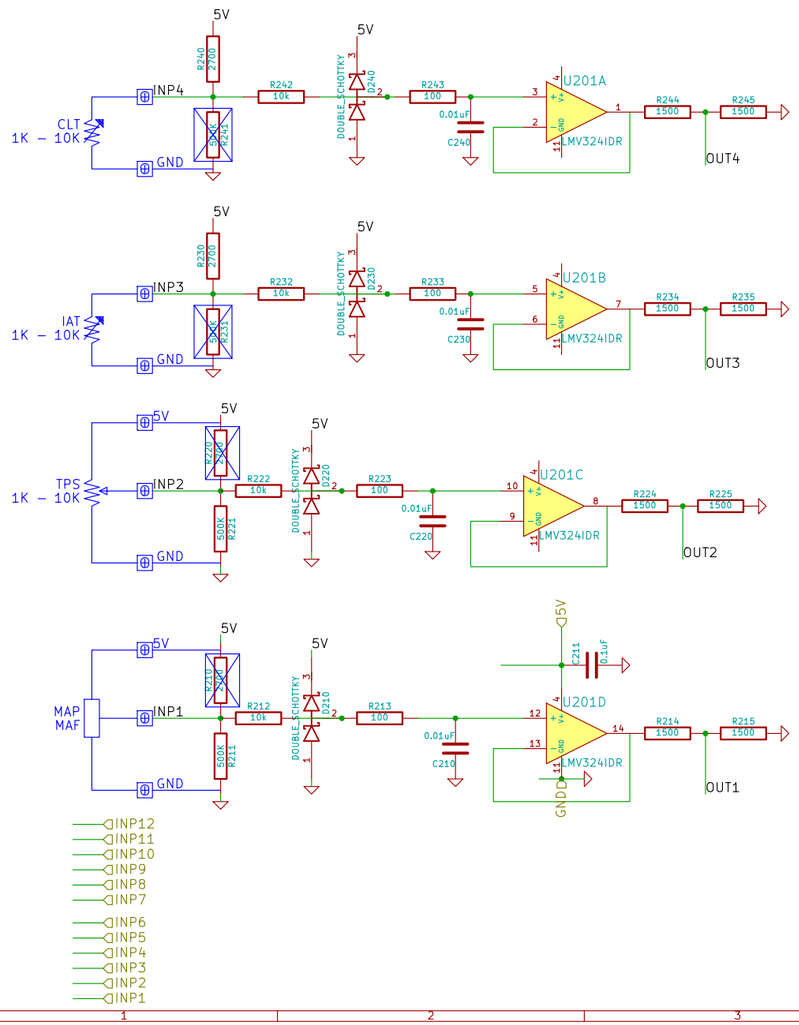
| | | |
|---|---|---|
| rusEFI.com | | |
| File: frankenso.sch | | |
| Sheet: / | | |
| Title: Frankenso | | |
| Size: B | Date: 20 oct 2014 | Rev: .02 |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 1/14 |

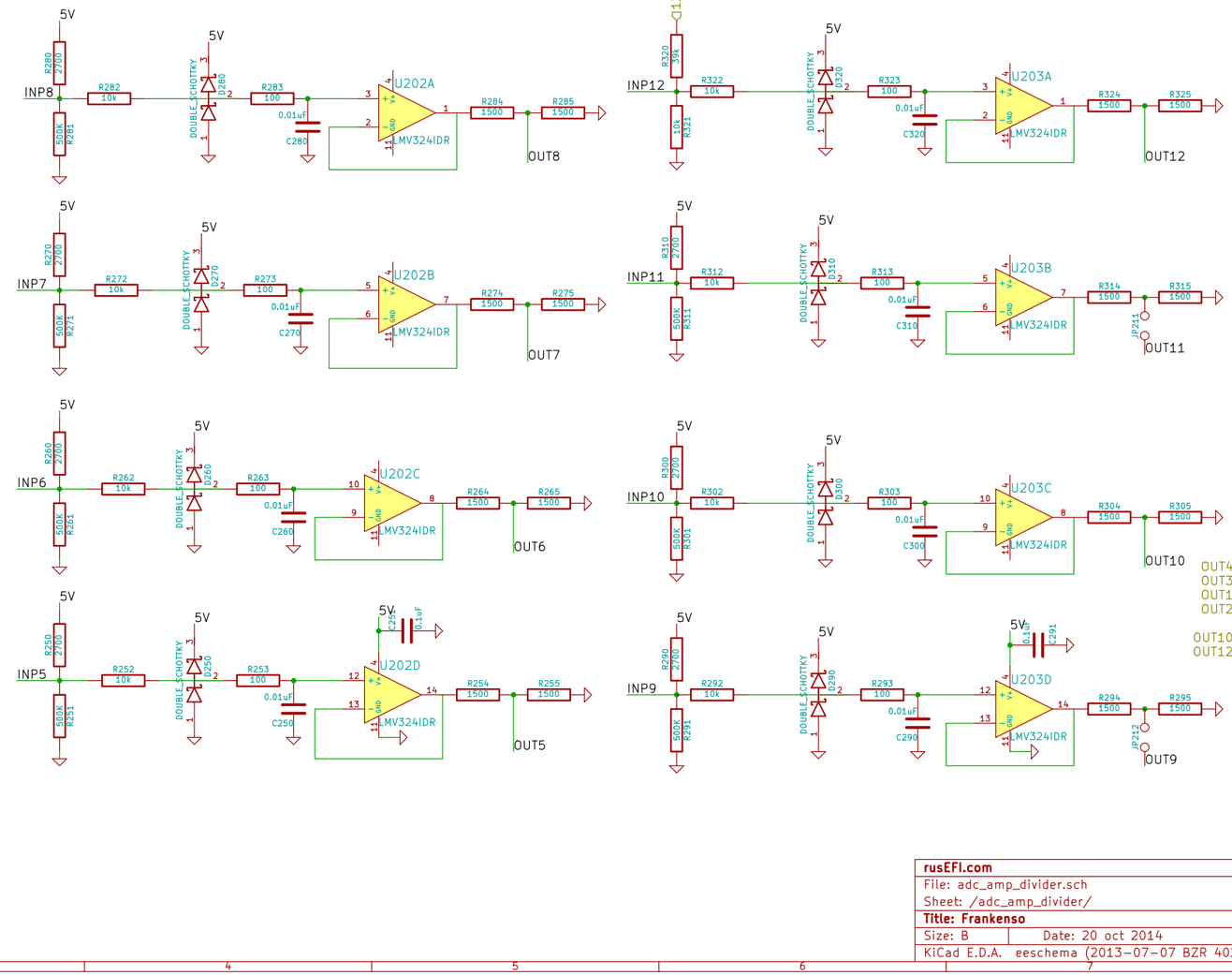
# 6 channel high / low side driver




| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: hi-lo.sch | | |
| Sheet: /hi-lo/ | | |
| **Title: Frankenso** | | |
| Size: B | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 2/14 |

SUGGESTED ENGINE WIRING IN BLUE

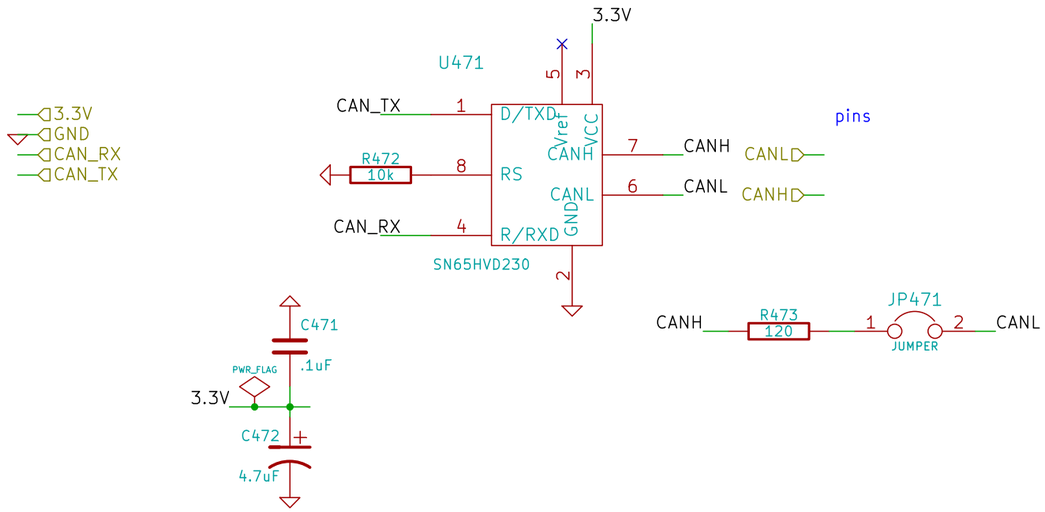






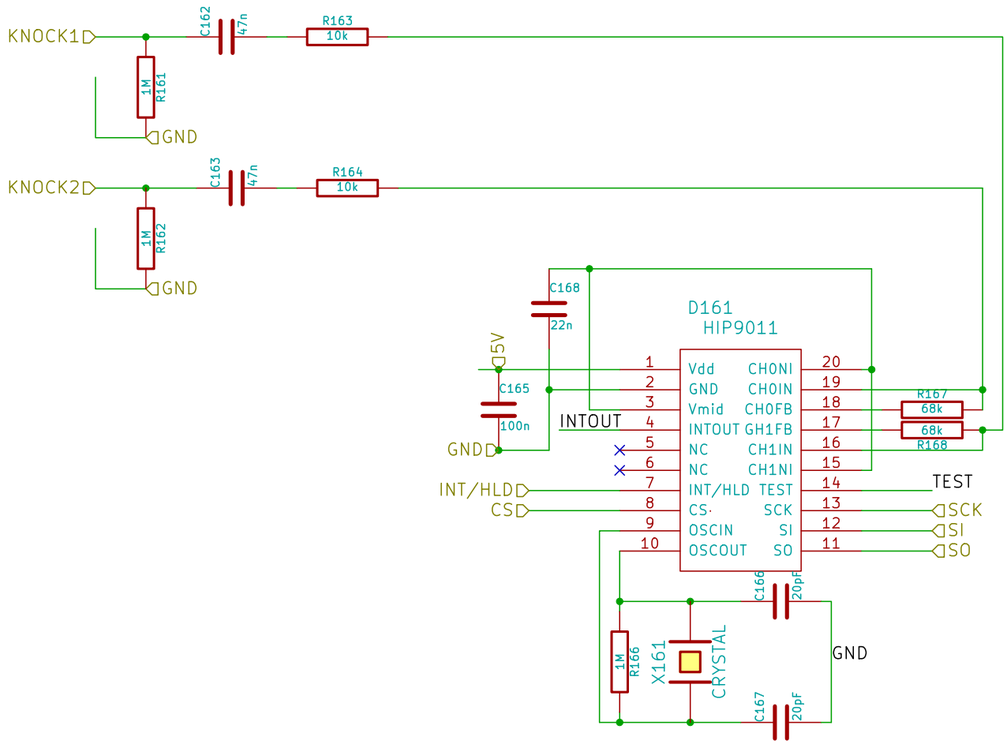
| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: adc_amp_divider.sch | | |
| Sheet: /adc_amp_divider/ | | |
| **Title: Frankenso** | | |
| Size: B | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. | eeschema (2013-07-07 BZR 4022)-stable | Id: 3/14 |

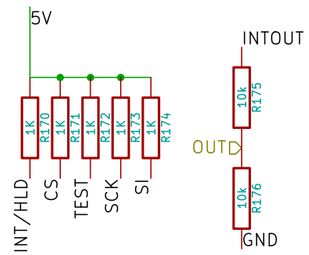



# CAN level shifter

| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: can_brd_1.sch | | |
| Sheet: /can_brd_1/ | | |
| **Title: Frankenso** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 4/14 |

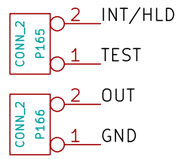
# DD_HIP9011 ver.2
# RusEfi.com



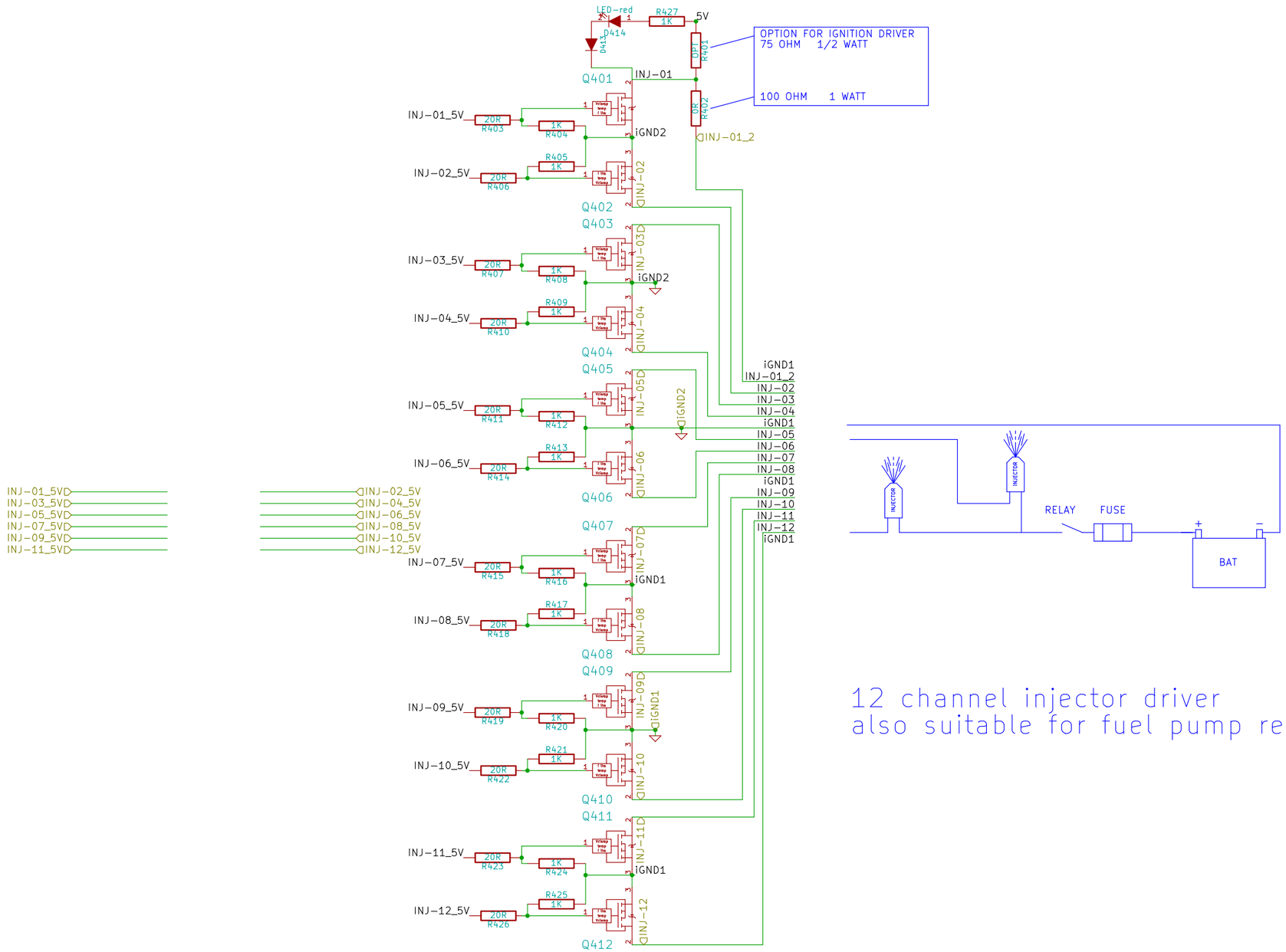










| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: DD_HIP9011.sch | | |
| Sheet: /DD_HIP9011/ | | |
| **Title: Frankenso** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 5/14 |




12 channel injector driver
also suitable for fuel pump relay, IAC solenoid etc

MISC NOTES

THE GENERAL SYSTEM LAYOUT IS SHOWN IN BLUE. THIS IS NOT
THE SUGGESTED SYSTEM WIRING, IT DOES SHOW THE GENERAL
OVERALL CIRCUIT LAYOUT TOPOLOGY.

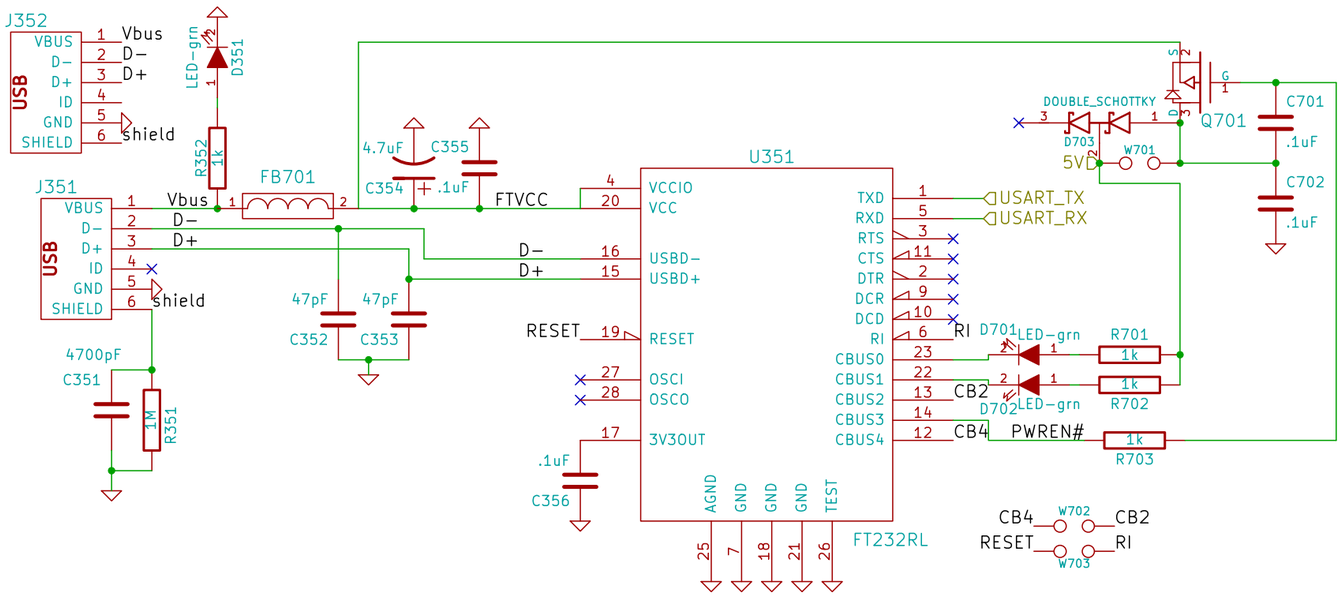
THE PCB WIRING IS SHOWN IN RED, GREEN WITH A BLUE BUS.

Screw terminals 1760500000

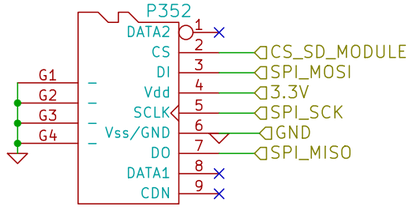
Screw connector PCB http://octopart.com/39522-1007-molex-655409
Screw connector harness http://octopart.com/partsearch#search/requestData&q=39520-0007

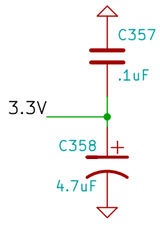
| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: inj_12ch.sch | | |
| Sheet: /inj_12ch/ | | |
| **Title: Frankenso** | | |
| Size: B | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 6/14 |

WJ01 IS A BACKUP PLAN. THE VOLTAGE DROP ACROSS D703 MAY BE NOT TOLERABLE, SO WE HAVE A BACK UP PLAN IF WE NEED TO BYPASS THE DIODE WITH A LOWER VOLTAGE DROP



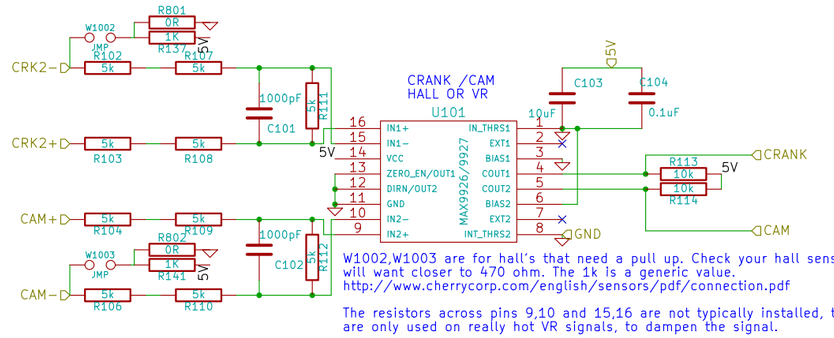

For right conn




# SD card slot
# USB TTL module

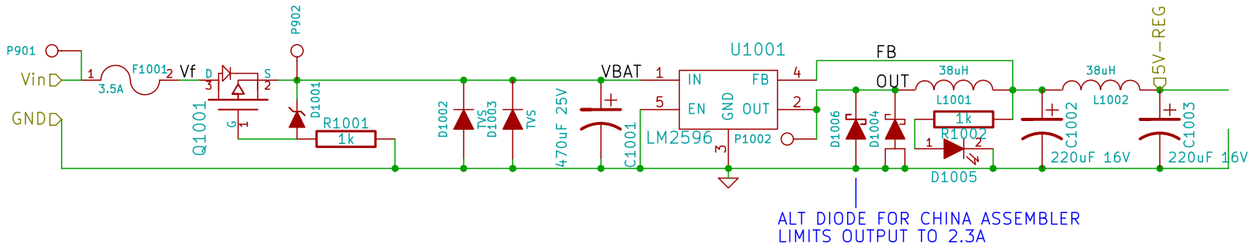
| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: mmc_usb_1.sch | | |
| Sheet: /mmc_usb_1/ | | |
| **Title: Frankenso** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 7/14 |



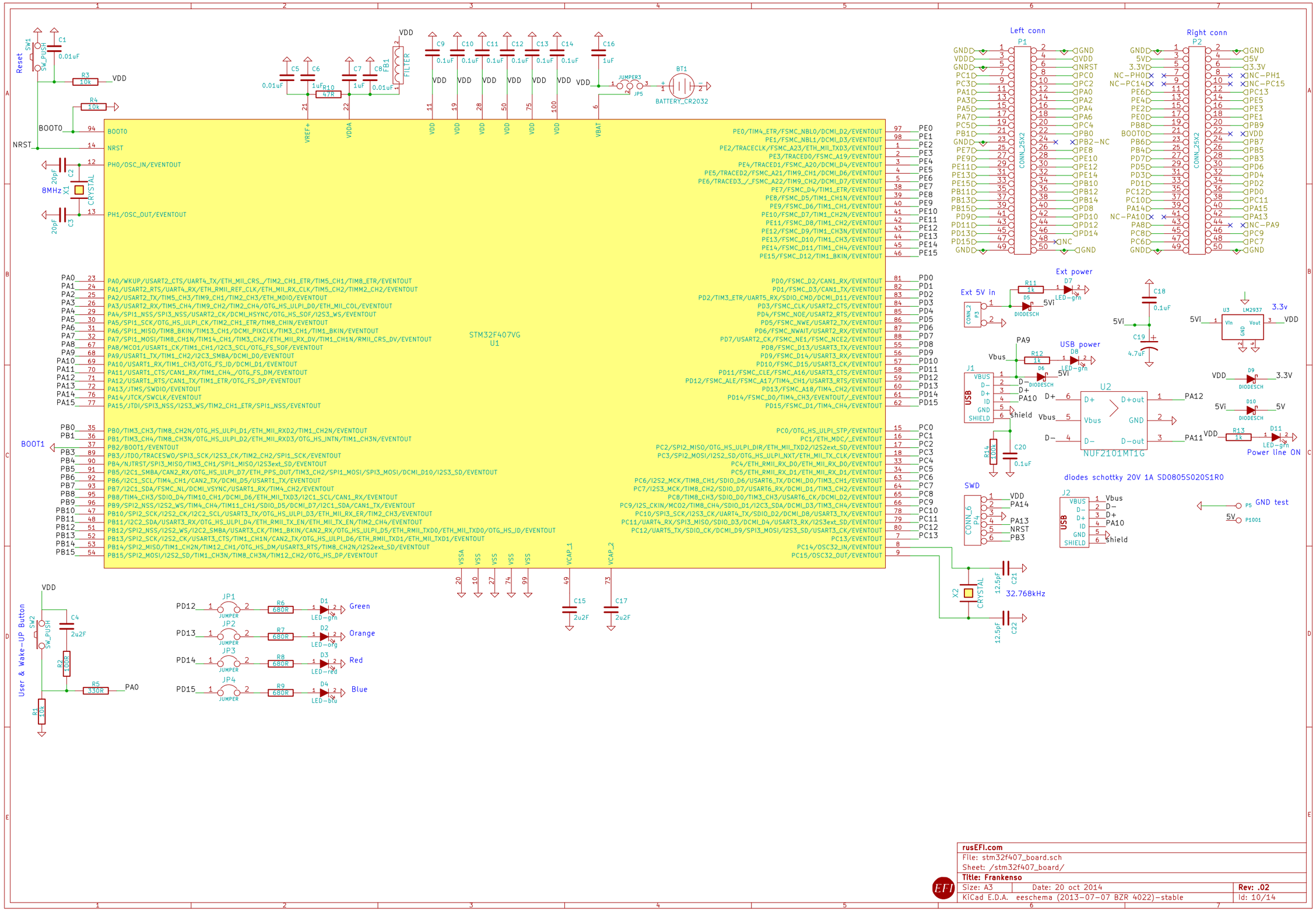

W1002,W1003 are for hall's that need a pull up. Check your hall sensors, many will want closer to 470 ohm. The 1k is a generic value.
http://www.cherrycorp.com/english/sensors/pdf/connection.pdf

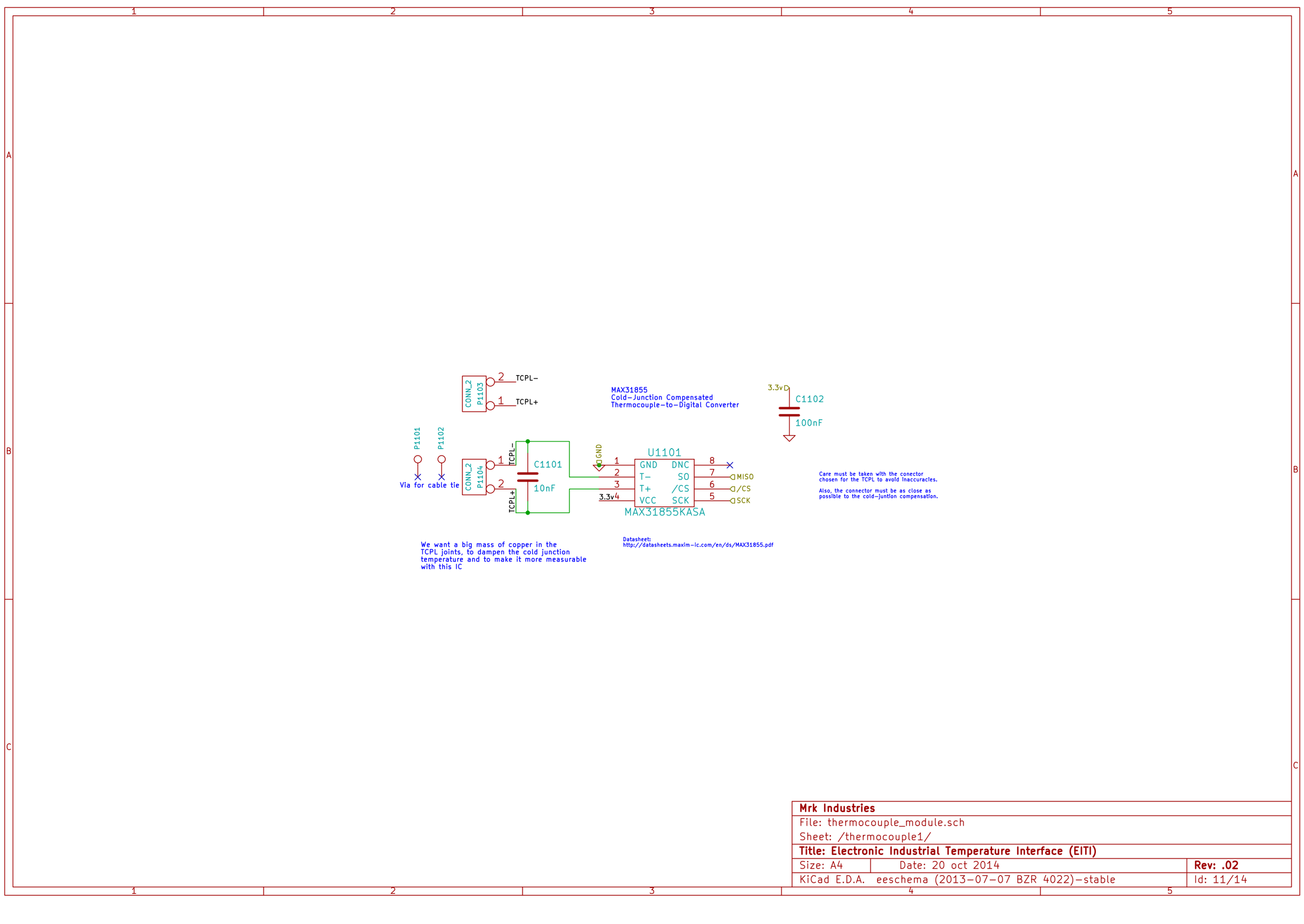
The resistors across pins 9,10 and 15,16 are not typically installed, they are only used on really hot VR signals, to dampen the signal.

| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: cps_vrs_io_1.sch | | |
| Sheet: /cps_vrs_io_1/ | | |
| **Title: Frankenso** | | |
| Size: B | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 8/14 |

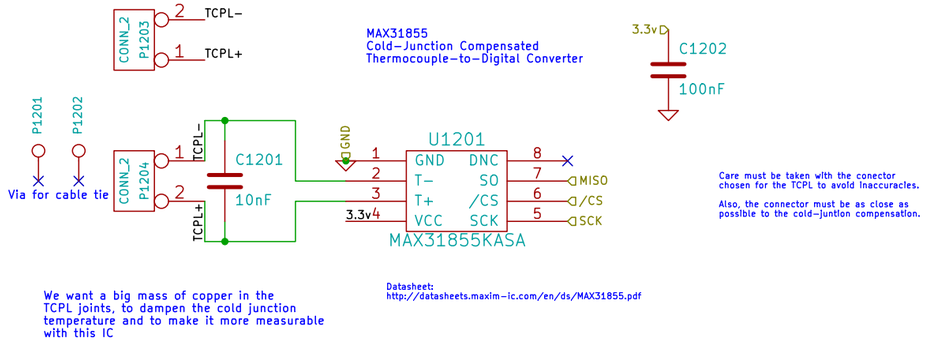



| | | |
|---|---|---|
| **rusEFI.com** | | |
| File: PWR_buck_12V_switcher.sch | | |
| Sheet: /PWR_buck_12V_switcher/ | | |
| **Title: Frankenso** | | |
| Size: A | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 9/14 |

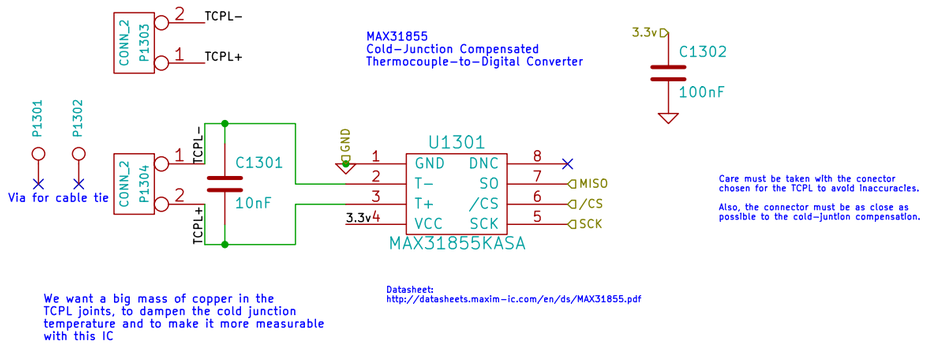

STM32F407VG
U1
Left conn
P1
Right conn
P2
Ext power
Ext 5V in
USB power
diodes schottky 20V 1A SD0805S020S1R0
NUF2101MT1G
Power line ON
SWD
User & Wake-UP Button
32.768kHz
rusEFI.com
File: stm32f407_board.sch
Sheet: /stm32f407_board/
Title: Frankenso
Size: A3
Date: 20 oct 2014
Rev: .02
KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable
Id: 10/14



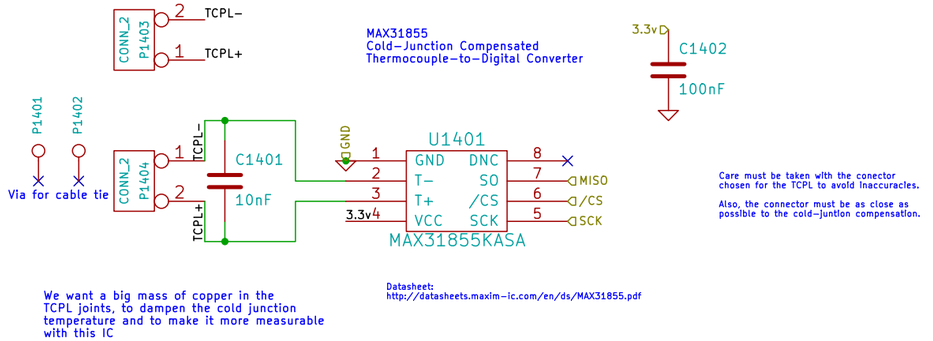

| | | |
|---|---|---|
| **Mrk Industries** | | |
| File: thermocouple_module.sch | | |
| Sheet: /thermocouple1/ | | |
| **Title: Electronic Industrial Temperature Interface (EITI)** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 11/14 |




| | | |
|---|---|---|
| **Mrk Industries** | | |
| File: thermocouple_module.sch | | |
| Sheet: /thermocouple2/ | | |
| **Title: Electronic Industrial Temperature Interface (EITI)** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 12/14 |




| | | |
|---|---|---|
| **Mrk Industries** | | |
| File: thermocouple_module.sch | | |
| Sheet: /thermocouple3/ | | |
| **Title: Electronic Industrial Temperature Interface (EITI)** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 13/14 |




| | | |
|---|---|---|
| **Mrk Industries** | | |
| File: thermocouple_module.sch | | |
| Sheet: /thermocouple4/ | | |
| **Title: Electronic Industrial Temperature Interface (EITI)** | | |
| Size: A4 | Date: 20 oct 2014 | **Rev: .02** |
| KiCad E.D.A. eeschema (2013-07-07 BZR 4022)-stable | | Id: 14/14 |