Bus types
General purpose bus
Ignition
Injection
Analog inputs (sensors)
Discrete inputs
LS & HS outputs
DC Motor

M5
Module-wbo-0.5
V5_IN
LSU_H- Power GND
LSU_H+ Heater negative
LSU_Rtrim
LSU_Ip
LSU_Vm
LSU_Un
GND Analog/digital
PULL_UP1
SEL1
PULL_DOWN1
PULL_UP2
SEL2
PULL_DOWN2
CAN_VIO
CANL
CANH
V33_OUT
SWCLK
SWDIO
nReset
VDDA
Internal TC2030 connector
#0
+5VA
GND
3_WBO_Heater
5_WBO_Rtrim
1_WBO_Ip
2_WBO_Vm
6_WBO_Un
J_VCC1
J_GND1
J_VCC2
J_GND2
CAN-
CAN+
J6
Conn_01x06

J3
5569-06A2
+12V_RAW

M7
Module-can-0.1
+5VA
+3.3VA
V5
CAN_VIO
CAN_RX
CAN_TX
CANL
CANH
GND
P1
P2

J5
5569-18A2
OUT_LS_HOT1
OUT_LS_HOT2
OUT_LS1
OUT_INJ1
OUT_INJ2
OUT_INJ3
OUT_INJ4
OUT_INJ5
OUT_INJ6
OUT_LS2
OUT_LS3
OUT_LS4
OUT_IGN1
OUT_IGN2
OUT_IGN3
OUT_IGN4
OUT_IGN5
OUT_IGN6

Pin	Name	Recommended function
B8	OUT_LS_HOT2	Fan Relay
B9	OUT_LS_HOT1	Main Relay
B16	OUT_LS4	Fuel Pump Replay
B18	OUT_LS2	Idle Air Valve
C8	GND	VR Shield
C15	IN_AUX3	Fuel Pressure
D10	IN_BUTTON2	A/C Request

All inputs are 12V-tolerant

OUT_IGN1..6 → Ignition → IGN1..6
OUT_LS_HOT1, OUT_LS_HOT2 → LS HOT → LS_HOT1, LS_HOT2
3.5A MAX Always hot capable
OUT_INJ1..6 → Injector → INJ1..6
OUT_LS1..4 → LS → LS1..4
3.5A MAX Solenoid load capable
F1 12H1500D
F2 12H1500D
F3 12H1500D
F4 12H1500D
R2 33k
R3 6.8k
IN_VMAIN
IN_VIGN
+12V
+12V_RAW
B5819W D2 D3 D4 D5
Flyback diodes
DC Driver 1
DC Driver 2
PWR OUT+ OUT- 3V3 PWM DIR DIS
DC1_PWM DC1_DIR DC2_PWM DC1_DIS DC2_DIS
VR_DISCRETE_THR

J4
5569-08A2
GND
12V_KEY
OUT_DC2+
OUT_DC1+

J10
5569-16A2
CAN-
CAN+
IN_PPS1
IN_FLEX
IN_BUTTON1
IN_AUX1
IN_CLT
IN_IAT
IN_KNOCK_RAW
IN_TPS1
IN_BUTTON2
IN_MAP
+5VP
GNDA

J2
5569-20A2
EGT+
EGT-
IN_BUTTON3
IN_HALL3
IN_HALL2
IN_HALL1
IN_PPS2
IN_AUX2
VR_DISCRETE-
VR_DISCRETE+
VR_MAX9924-
VR_MAX9924+
IN_AUX3
IN_TPS2

Pin 8 may be used for shielding VR signals

M3
Module-vr-discrete-0.5
Install R770 for use with very hot VR signals, to dampen the signal
VR+ VR- V5_IN GND OUT OUT_A Thresh_IN
VR_DISCRETE+W2
VR_DISCRETE-W1
VR_DISCRETE
VR_DISCRETE_A
P5

M4
Module-vr-max9924-0.1
Install R775 for use with very hot VR signals, to dampen the signal
VR+ VR- V5_IN GND OUT NC NC
VR_MAX9924+W2
VR_MAX9924-W1
VR_MAX9924
P6

R1 DNP +5VP
Install a 4.7 kOhm R1 resistor for using VR2- as a hall sensor input

R5 DNP

Move the resistor from position R6 to R5 to use ADC3 for receiving the analog signal VR-DISCRETE instead of the knock signal

M2
Module-knock-0.2
VREF V5A
VREF1
IN_KNOCK_RAW W1
IN_KNOCK OUT_KNOCK GND
E3 IN_KNOCK R6 0
E2 GND

M1
Module-power_12and5V-0.3
+12V_RAW
V12_RAW V12_PERM IN_VIGN PWR_EN EN_5VP GND
V12 VBAT VIGN 5V 5VP PG_5VP
VBAT
VIGN
+5V
+5VP
R4 PG_5VP
S1 GND

M6
Module:mega-mcu100/0.3
IGN1_(PC13) IGN2_(PE5) IGN3_(PE4) IGN4_(PE3) IGN5_(PE2) IGN6_(PB8) IGN7_(PB9) IGN8_(PE6)
OUT_INJ1_(PD3) OUT_INJ2_(PA9) OUT_INJ3_(PD11) OUT_INJ4_(PD10) OUT_INJ5_(PD2) OUT_INJ6_(PA8) OUT_INJ7_(PD15) OUT_INJ8_(PD12)
OUT_PWM1_(PD13) OUT_PWM2_(PC6) OUT_PWM3_(PC7) OUT_PWM4_(PC8) OUT_PWM5_(PC9) OUT_PWM6_(PD14)
IN_BUTTON1_(PC1) IN_BUTTON2_(PC6) IN_FLEX_(PA11)
IN_TPS_(PA4) IN_PPS_(PA3)
IN_IAT_(PC3) IN_CLT_(PC2)
IN_O2S_/_CAN_WAKEUP_(PA0) IN_O2S2_(PA1)
IN_MAP1_(PC0) IN_MAP2_(PC1)
IN_AUX1_(PB0) IN_AUX2_(PC4/PE9) IN_AUX3_(PA7) IN_AUX4_(PC5)
IN_KNOCK_(PA2)
IN_D1_(PE12) IN_D2_(PE13) IN_D3_(PE14) IN_D4_(PE15)
VREF1 VREF2 V33_REF
OUT_PWR_EN_(PE10)
IN_VIGN_(PA5) VBAT VCC GND
SPI2_SCK_/_CAN2_TX_(PB13) SPI2_MISO_(PB14) SPI2_MOSI_(PB15) SPI2_CS_/_CAN2_RX_(PB12)
uSD card and accelerometer on SPI1 bus
SPI3_SCK_(PC10) SPI3_MISO_(PC11) SPI3_MOSI_(PC12) SPI3_CS_(PA15)
CANH CANL
I2C_SDA_(PB11) I2C_SCL_(PB10)
Barometer on this I2C bus
UART8_RX_(PE0) UART8_TX_(PE1)
F40x does not have UART8
UART2_RX_(PD6) UART2_TX_(PD5)
USBP_(PA12) USBM_(PA11) USBID_(PA10) VBUS
SWCLK_(PA14) SWDIO_(PA13) SWO_(PB3)
Internal TC2030 connector
nReset BOOT0
Internal buttons
LED_GREEN LED_YELLOW
V33_SWITCHABLE
V5A_SWITCHABLE
Connected
DC1_DIS DC2_DIR SCK3 MISO3 PG_5VP VR_DISCRETE VR_MAX9924 USB+ USB- CAN+ CAN- EGT+ EGT- DC2_DIS

Move the resistor from position R143 to R145 to enable the CAN WAKEUP function. The AUX1 analog input will be unavailable.

MAP OUT

D1 1N4148WS
BT1 CR1220

Configurable "BUTTON" pulls
R38 DNP IN_BUTTON1 R35 10k
R39 DNP IN_BUTTON2 R36 10k
R40 DNP IN_BUTTON3 R37 10k

C33 100n
U5 JDY-33 Bluetooth Module
3V3 GND TXD RXD IO1 IO2 EN ALED STAT
P7 P8

J8 USB_B_Mini
J7
J9 USB_C
R7 5.6k R8 5.6k
DNP

J13 J12 J11 J1 J14 J15 J16 J17 J18 J19 J20 J21 J22 J24

PROTO_AREA PROTO_AREA
+12V_RAW +5VA +3.3VA GND GND
H1 M3 H2 M3 H3 M3 H4 M3

Hellen-One-PCB-logo
https://rusefi.com/s/uaefi
rusEFI.com
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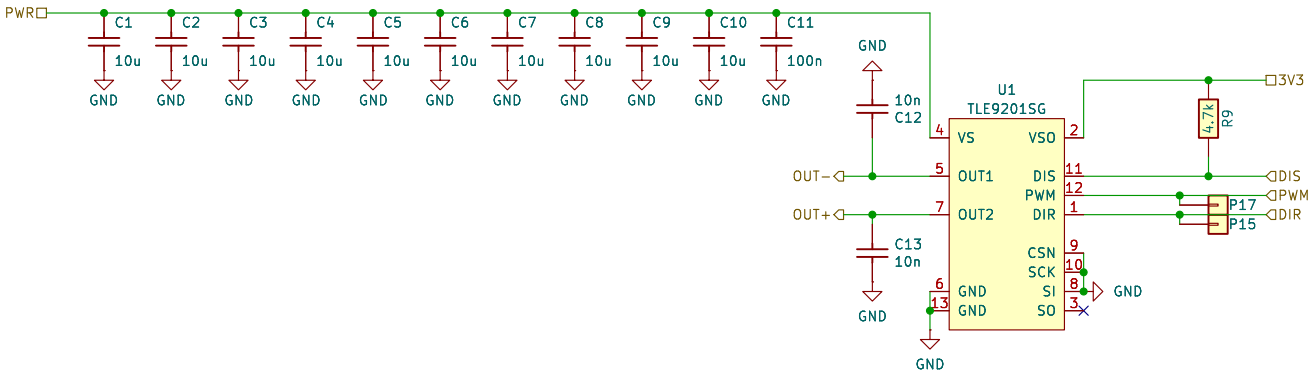
KiCad E.D.A. 8.0.9 | Id: 1/9



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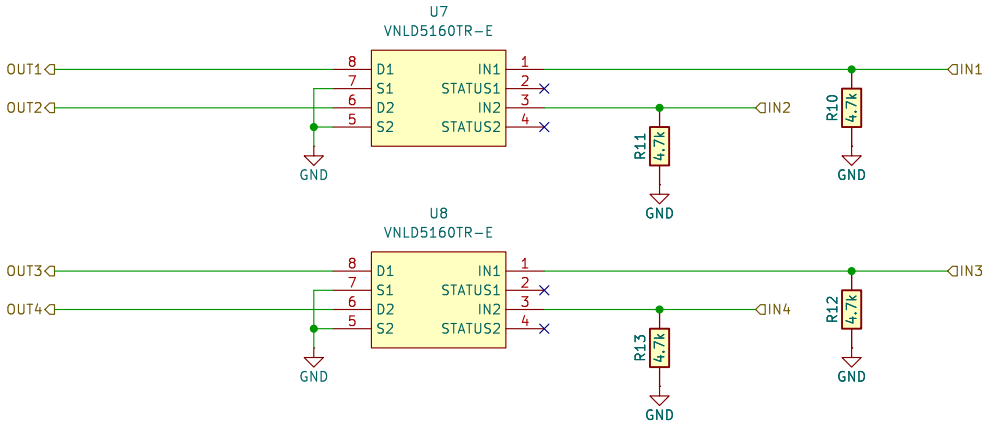
KiCad E.D.A. 8.0.9		Id: 2/9



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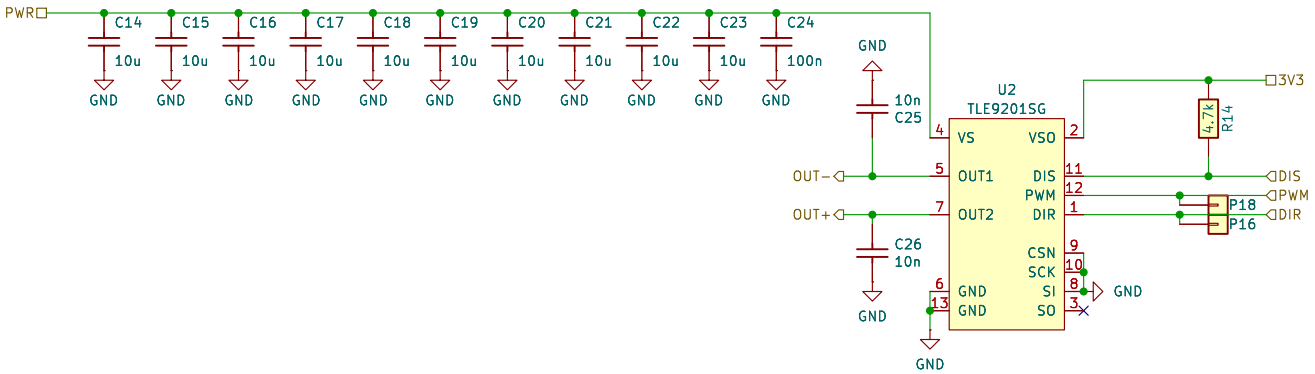

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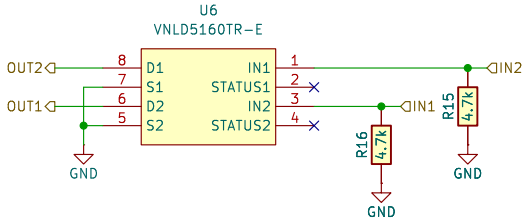

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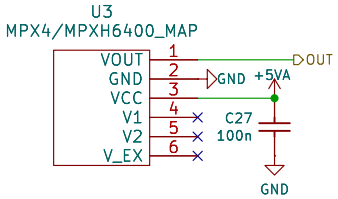

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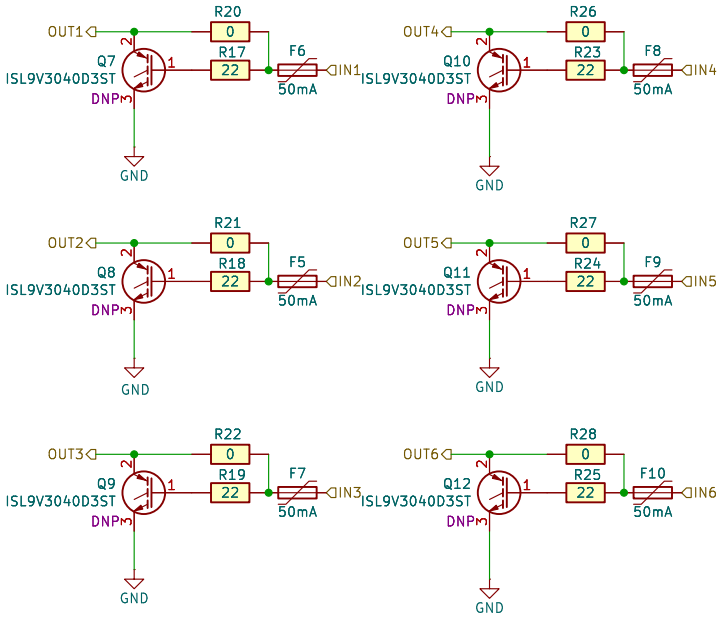
Title: UAEFI

Size: A4	Date: 2025-04-30	**Rev: E**
KiCad E.D.A. 8.0.9		Id: 8/9

Remove R20–R22, R26–R28, and install Q7–Q12 for use with dumb coils



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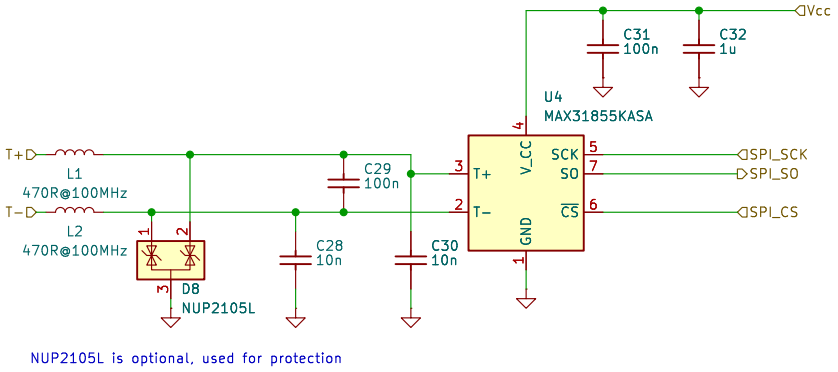

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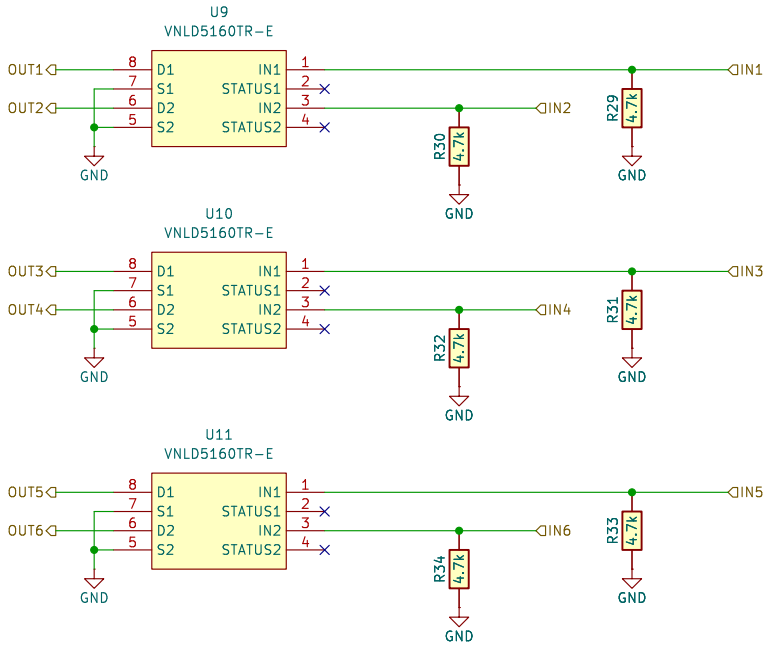

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