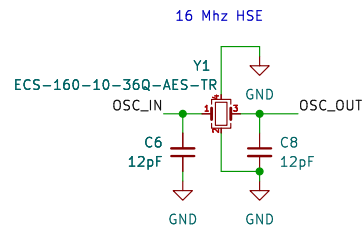
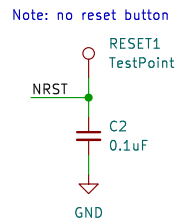
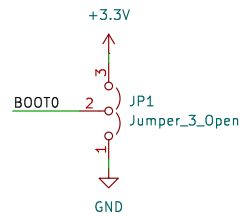
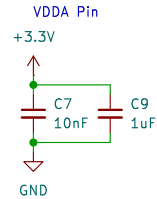
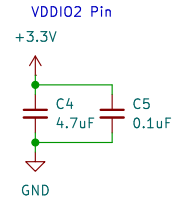
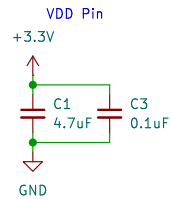


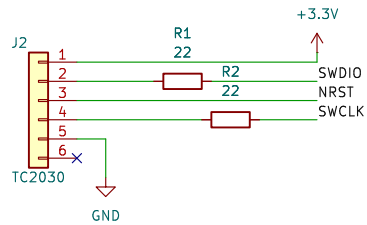


- power supply de-coupling
- TC2030 programming
- boot select switch
- 16 Mhz HSE oscillator
- status LEDs

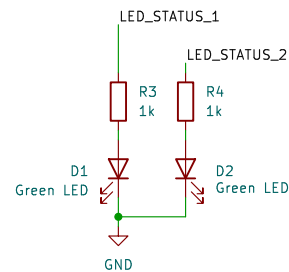


BOOT0 -> 3.3V: Boot to system memory  
BOOT0 -> GND: Boot to flash memory (normal)

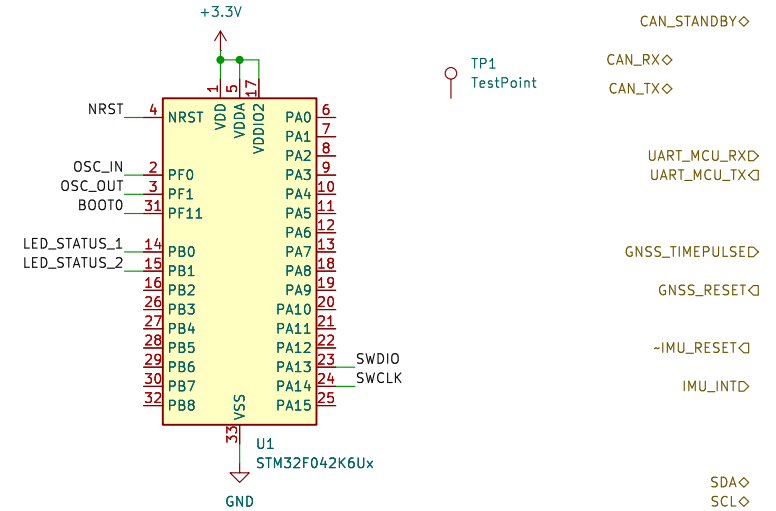
## TC2030-NL Programming



## Status LEDs



## Microcontroller



## CubeMX Setup

Sheet: /Microcontroller/  
File: stm32f042k6ux.kicad\_sch

### Title:

Size: A4

Date:

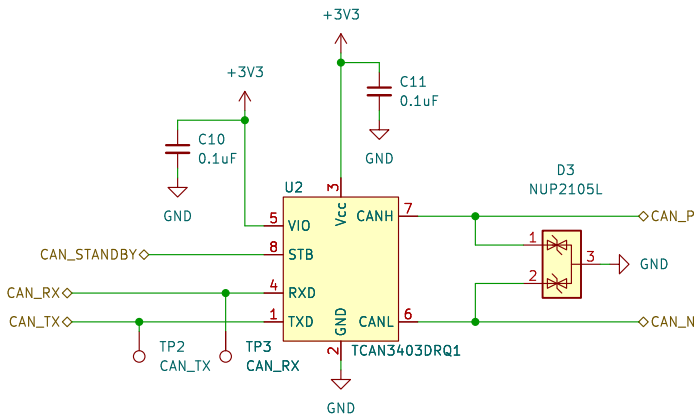
Rev:

KiCad E.D.A. 9.0.1

Id: 2/6

# CAN Bus Tranciever

- no termination
- non-isolated
- TCAN3403 is pin compatible with other TI transievers
- TVS Diode Protection



Sheet: /CAN Transciever/  
File: can\_transciever\_no\_term.kicad\_sch

**Title:**

Size: A4

Date:

KiCad E.D.A. 9.0.1

**Rev:**

Id: 4/6

Note:

- Generally, use software reset over the UART, RESET\_N triggers the RAM to clear and the firmware reloaded from flash
- RF\_IN: 50 ohm characteristic impedance on transmission line
- Battery backup is needed for hot start

Interface:

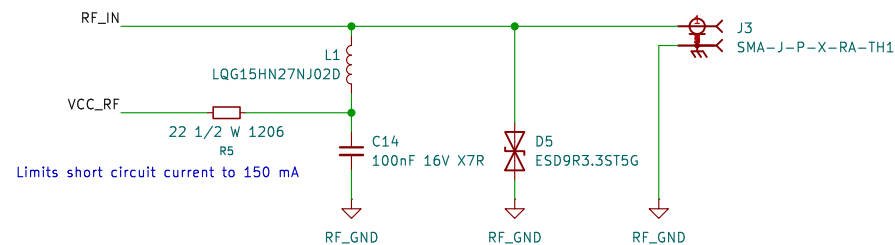
- D\_SEL to VCC or open: UART or I2C. D\_SEL -> GND: SPI
- UART 9600 baudrate
- 8 bit no parit, 1 stop



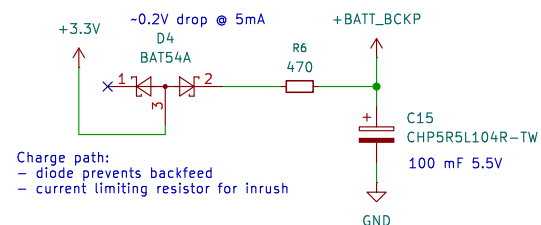
Layout notes:

- RF\_IN must have 50 ohm characteristic impedance
- use GND via wall around microstrip
- no stubs

ANN-MB5 has SMA (plug) connector



Backup operating voltage: 1.65 – 3.6 V  
Backup current: 45 uA typical  
Target backup operating time: 30 min (1800 s)



```

I = Q / t
C = Q1 / V_low
C = Q2 / V_high
Q = Q2 - Q1
t = (Q2 - Q1) / I
t = C * (V_high - V_low) / I
C = t * I / (V_high - V_low)

```

1.5 safety factor  
 $(1800 * 1.5) * 45E-6 / (3.3 - 0.2 - 1.65) = 84 \text{ mF minimum}$

Sheet: /GPS Module/  
File: gps\_ublox\_max-f10s.kicad\_sch

**Title:**

Size: A4	Date:
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KiCad E.D.A. 9.0.1

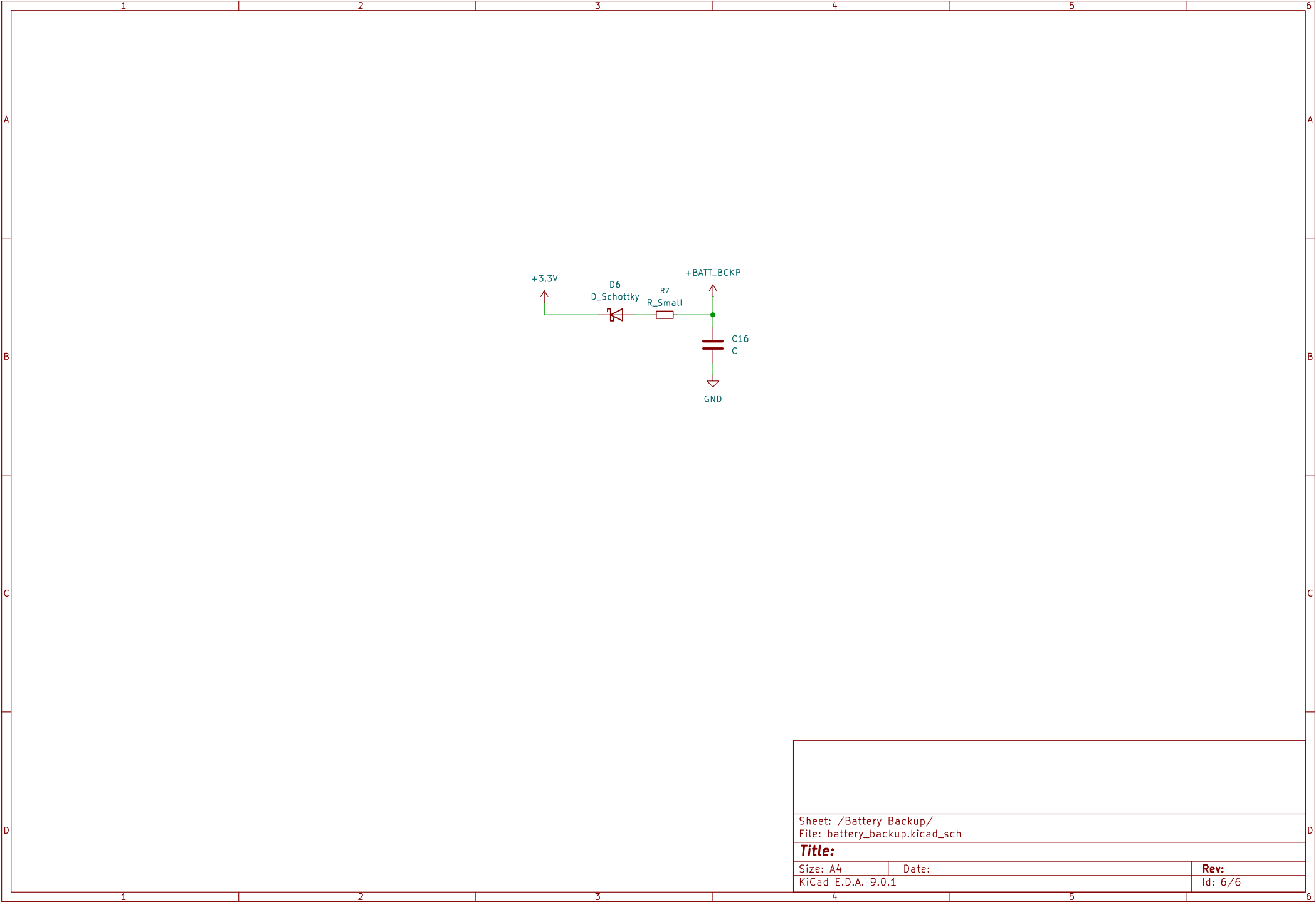
Date:

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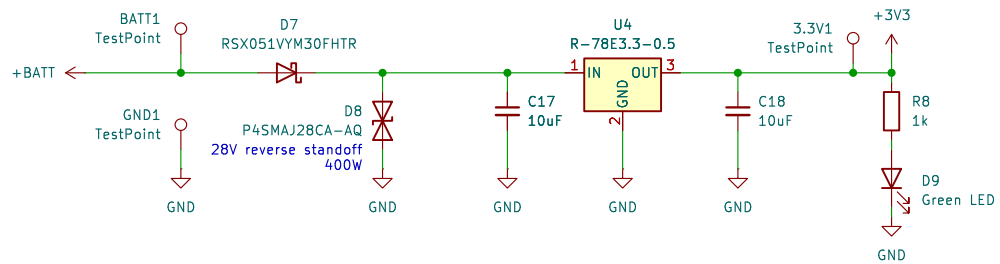
1

Rev:	
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Id: 5/6



Input: 6-28 VDC  
Output: 3.3V Fixed 500 mA  
Protection:  
- short circuit  
- reverse polarity  
- ESD



Sheet: /3.3V Switching Regulator/  
File: power\_supply\_switching\_module\_3.3V.kicad\_sch

**Title:**

Size: A4

Date:

Rev:

KiCad E.D.A. 9.0.1

Id: 7/6