

### Features

- Real-time vehicle tracking system based on GPRS/GSM/GNSS. The vehicle location coordinates are acquired using FASTRAX GPS/GLONASS module and sent over GPRS to the web server-based fleet tracking application
- Web GUI-based application based on API's provided by third party map provider "Open Street Maps" can monitor up to 10 vehicles, their known location and status
- Car lift alarm for anti-theft feature ( MEMS-based)
- Black box functionality: in case of vehicle crash (detected using MEMS), vehicle status and location parameters are stored in the micro SD card and SMS. In all other cases any alarm notification is through web-based GUI
- Tamper and panic detection, and alarm
- Local graphic display of information such as vehicle status, location coordinates, speed, distance covered, GPS strength, GSM signal strength, time and date
- Ability to send alert message from web application to be show on tracking system display
- Buzzer on vehicle unit for alarm indication
- On-board user switch for different actions
- RoHS compliant

### Description

The STEVAL-IEG001V1 is a smart vehicle tracking system reference design based on GPS-GLONASS/GSM-GPRS. The system is built around the Cortex-M3 STM32F20x microcontroller series. Today, tracking and navigation systems for vehicles are extensively used all over the world by public transportation units, fleet owners and individuals, and are



essential parts of vehicle telematics systems. The design consists of a vehicle unit (to be installed inside the vehicle) and remote web server application where the vehicle status and movement information may be viewed in an intuitive way on the map. The vehicle unit is built around the Cortex-M3 STM32F20x microcontroller, Fastrax GNSS (TESEO II) module and a SAGEM GSM/GPRS module. The vehicle unit gathers the GPS/GLONASS information on geographic coordinates, time, date, speed, in-journey distance traveled and satellites fixed, and sends this information over GPRS to the web server application. The web application shows the current location and status information of the vehicle on open street maps. The same information is displayed locally on the graphical LCD display. This unit also consists of MEMS sensors LIS331DLH 3-axis accelerometer, and L3G4200D yaw/pitch/roll gyroscope. This unit also serves as a theft detection unit and senses car lift using MEMS. In case of vehicle crash (detected using MEMS), the vehicle status and location parameters are logged in the micro SD card, and the same information is sent to the administrator over SMS, thereby providing black-box functionality.

# 1 Schematic diagrams

Figure 1.  $\mu$ SD connections

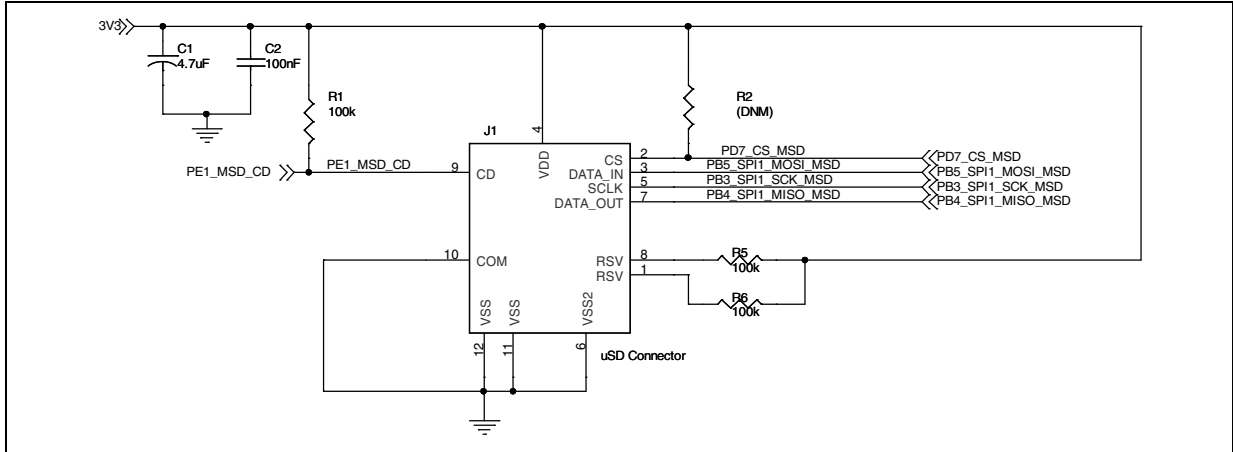


Figure 2. IrDa transceiver

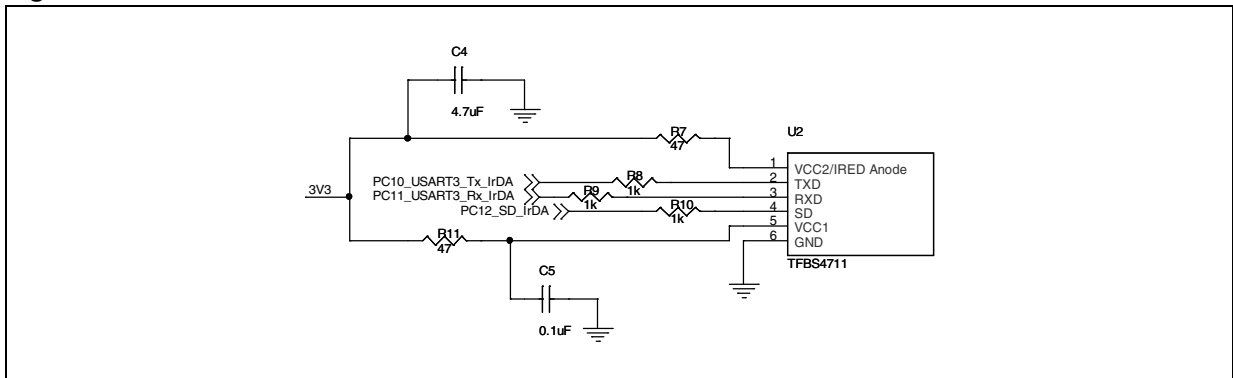


Figure 3. EEPROM section

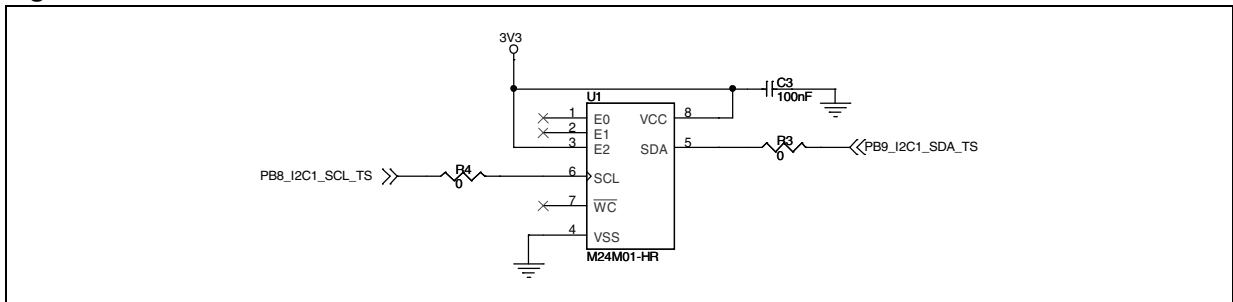


Figure 4. LCD connector on VTS motherboard

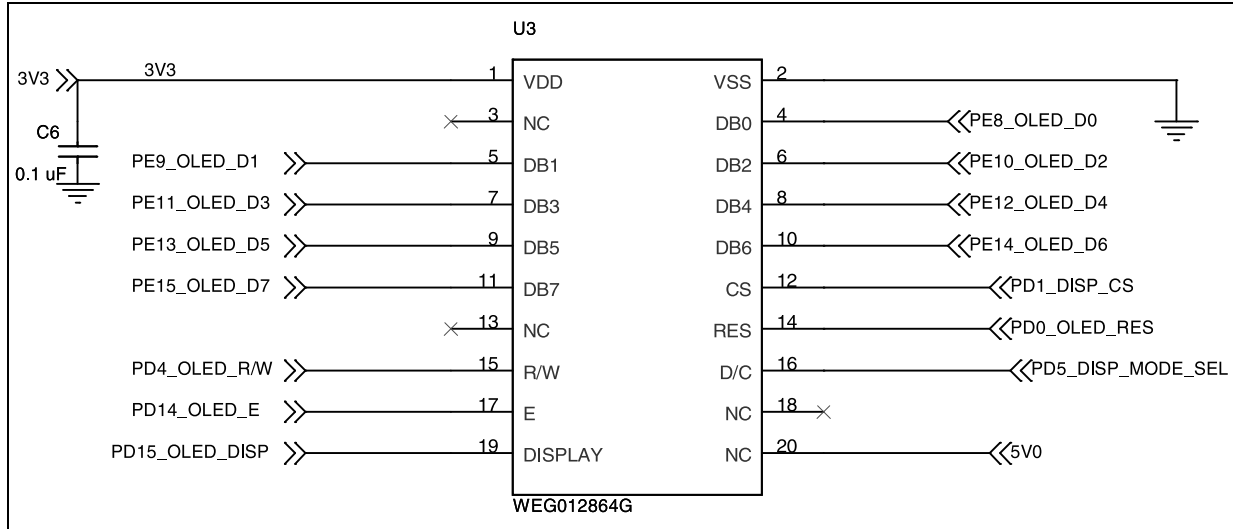


Figure 5. Graphical LCD daughter card

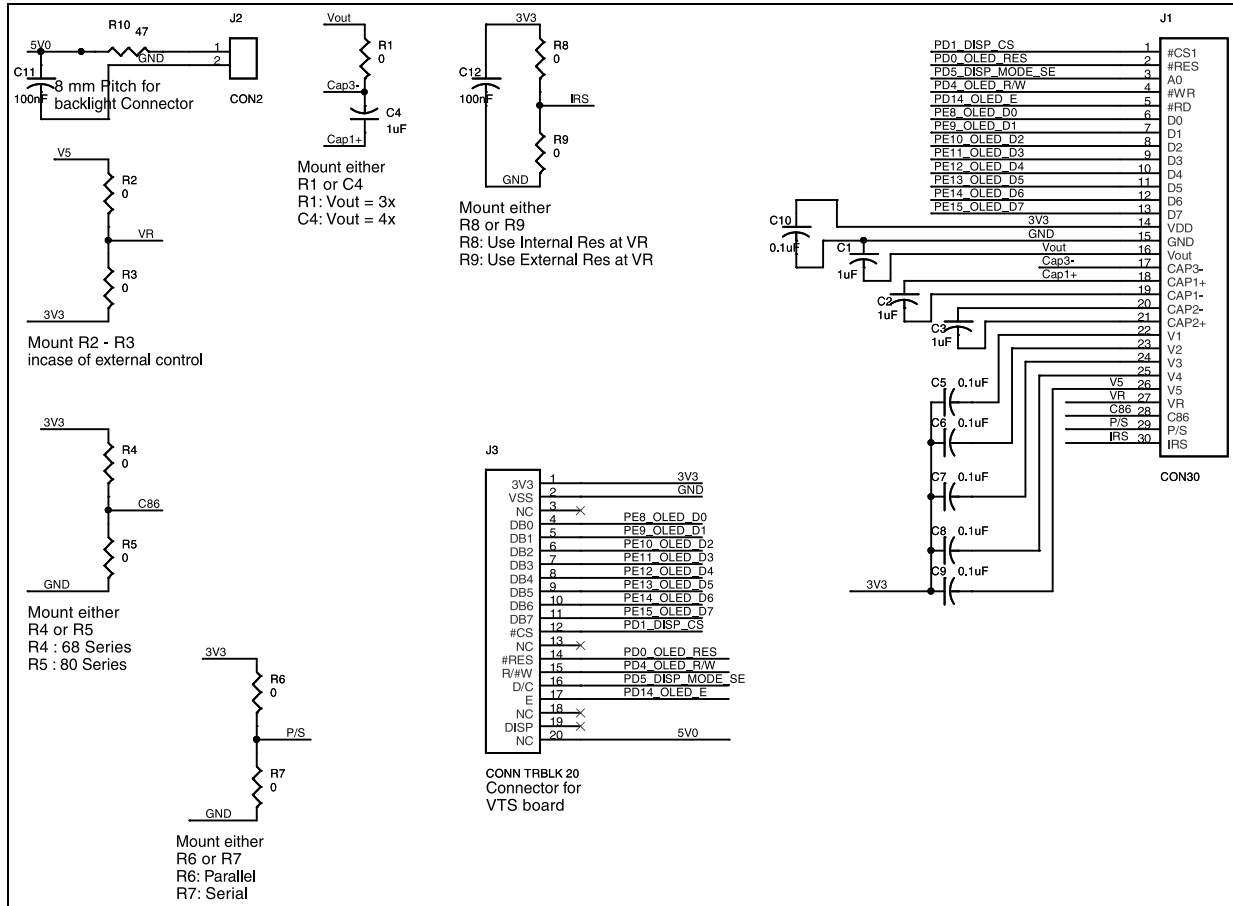




Figure 8. SIM card section

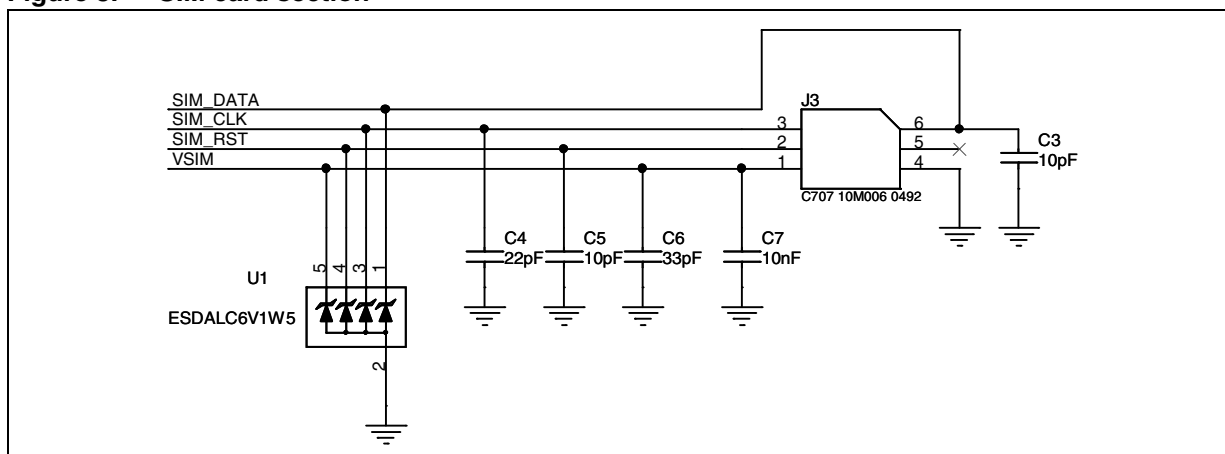


Figure 9. Compatibility between STM32F10x and STM32F20x

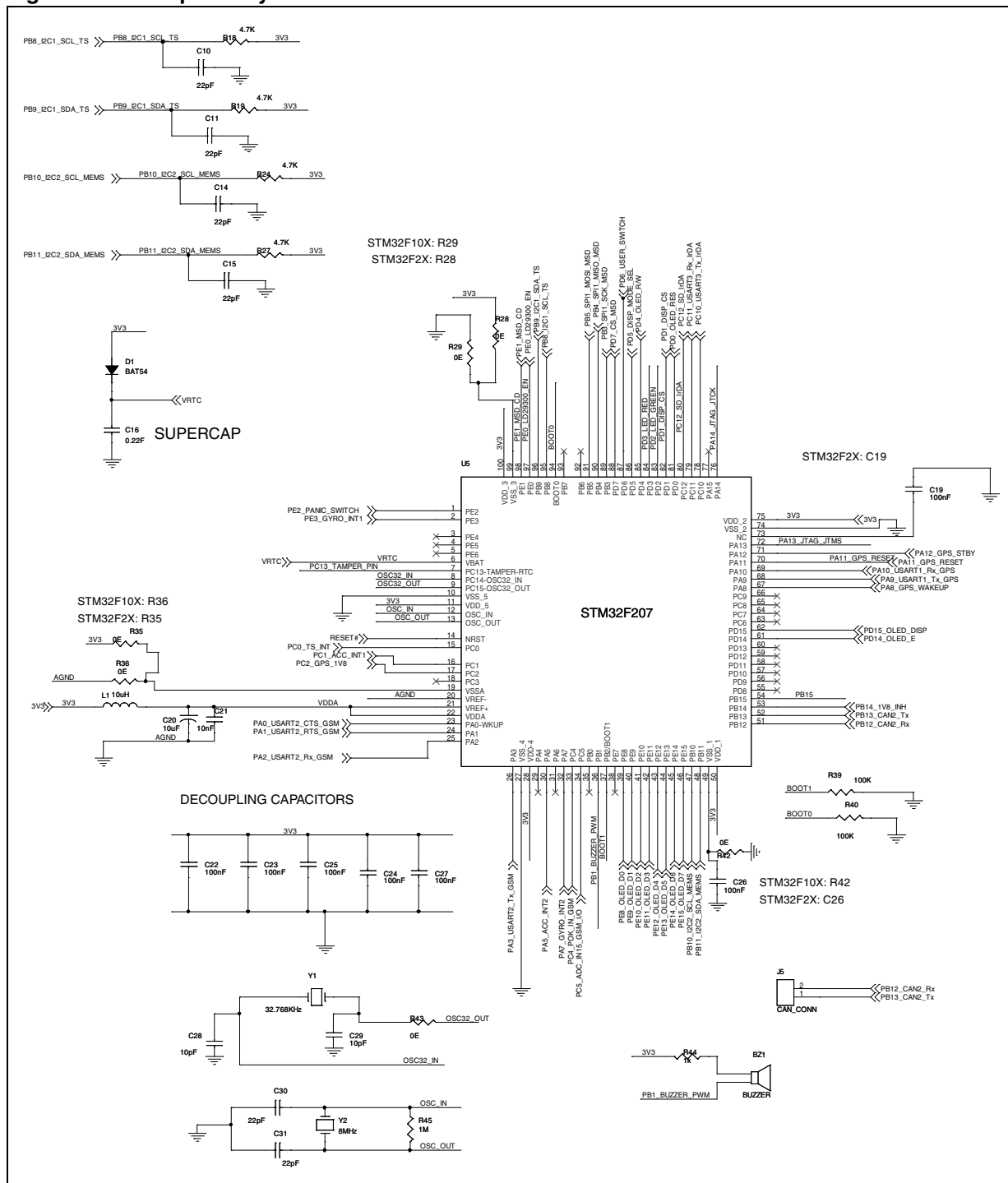


Figure 10. Switch section

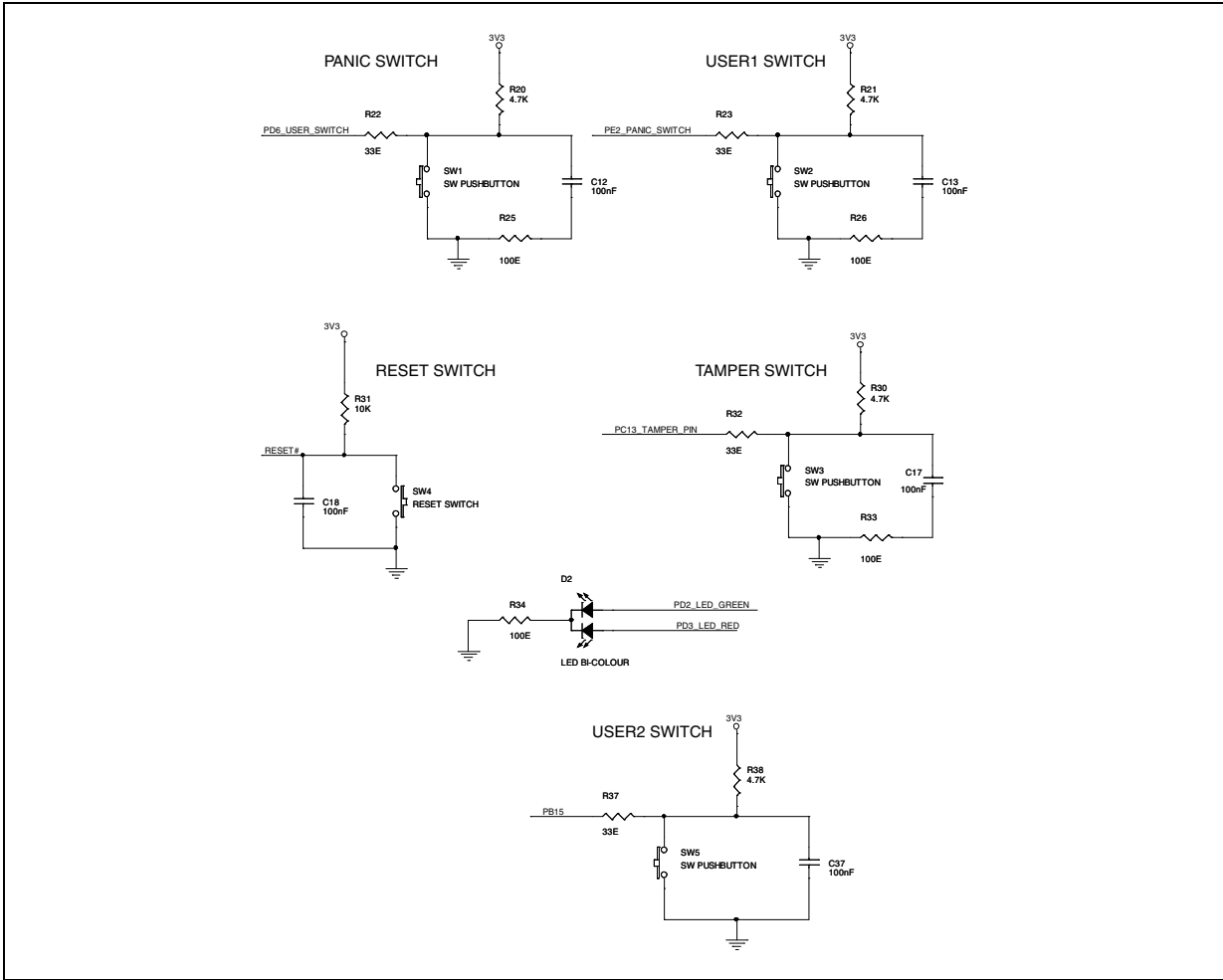


Figure 11. SWD section

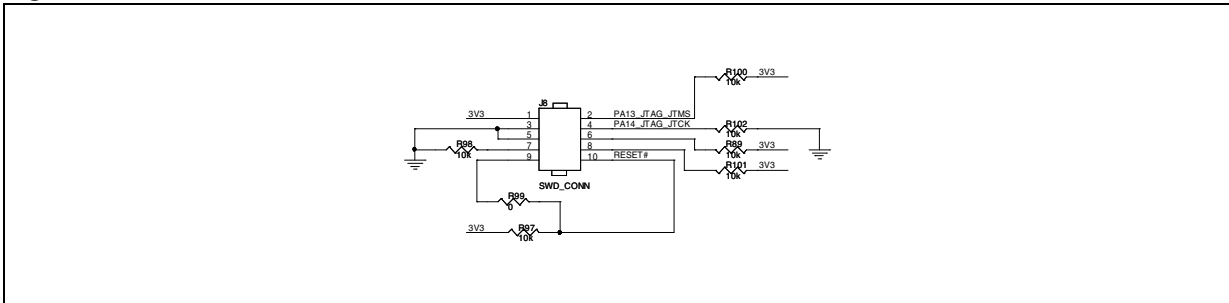


Figure 12. 5 V regulator

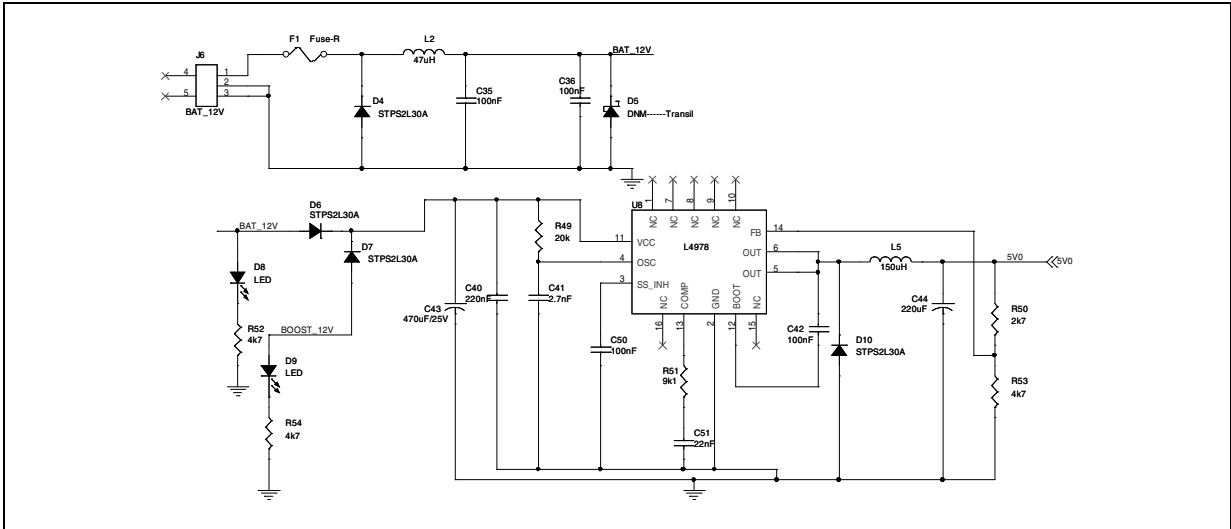


Figure 13. L6924D battery charger

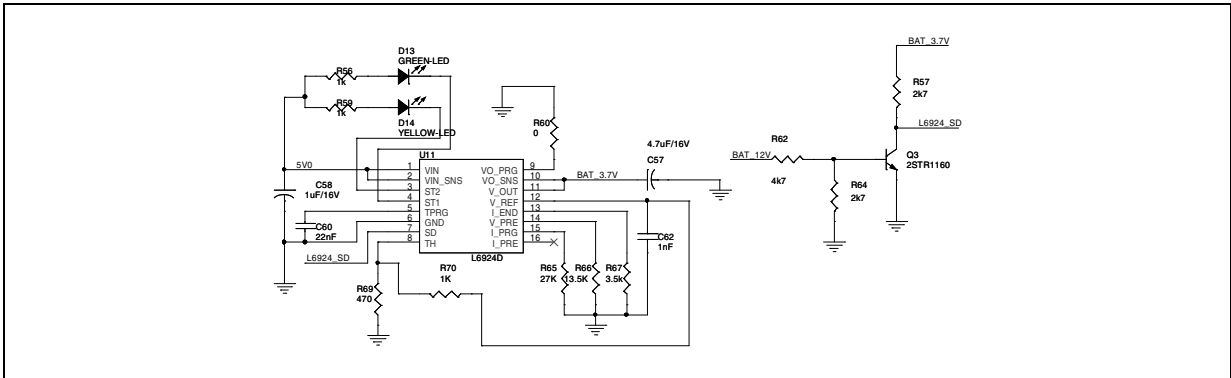


Figure 14. Voltage regulators

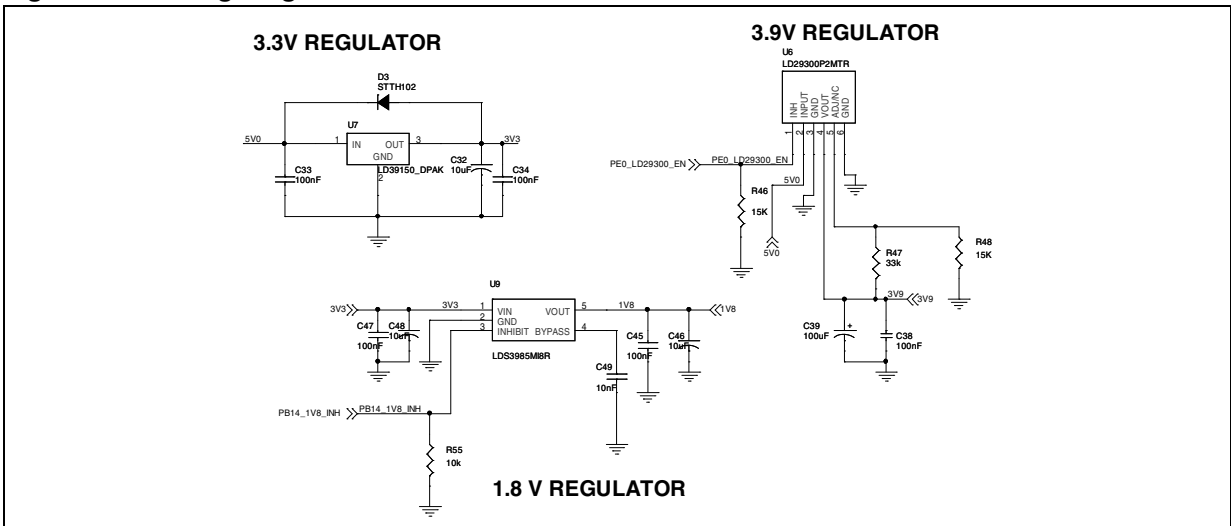




Figure 15. Boost using STLDC08

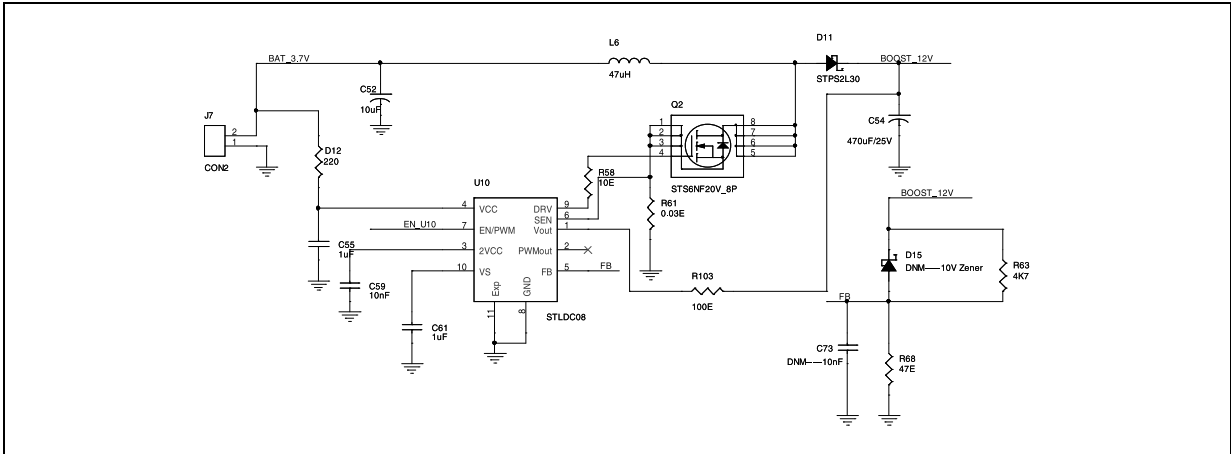


Figure 16. Battery protection and boost/charger synchronization

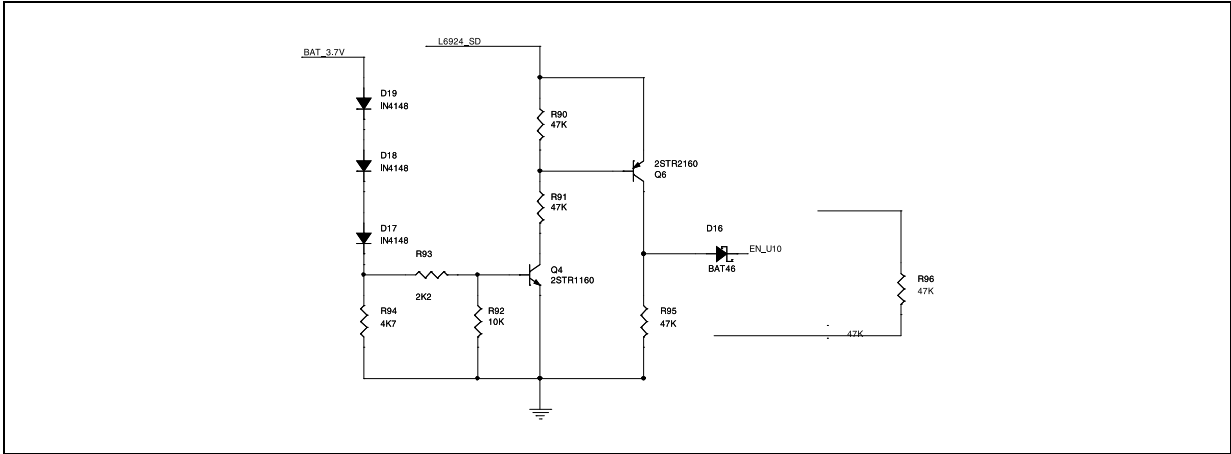


Figure 17. Gyroscope section

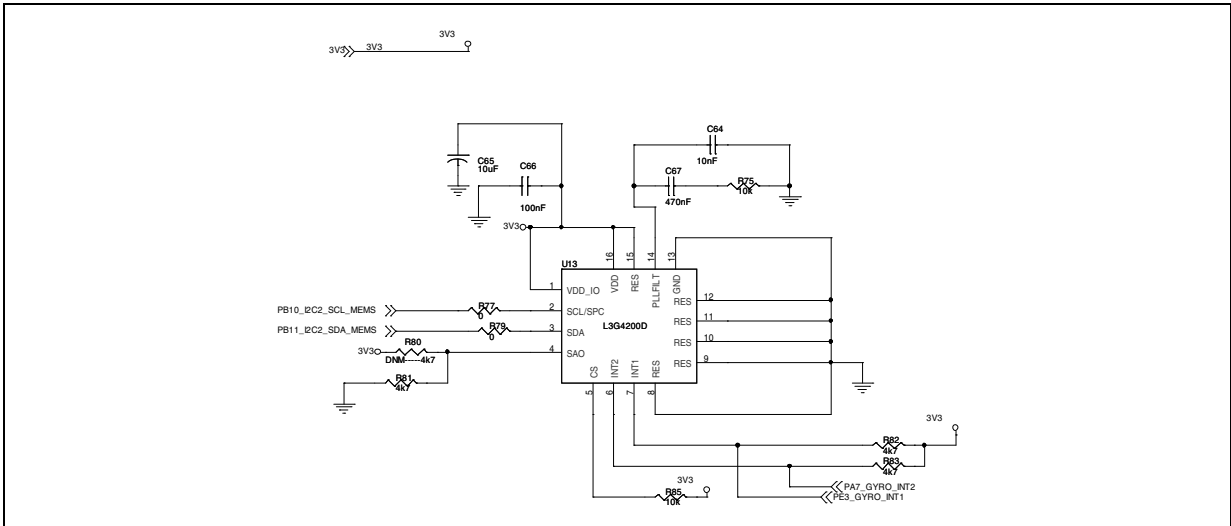


Figure 18. Temperature sensor

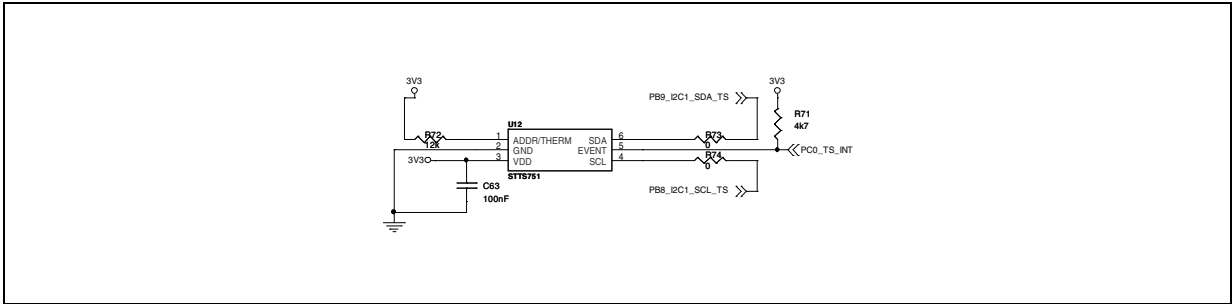
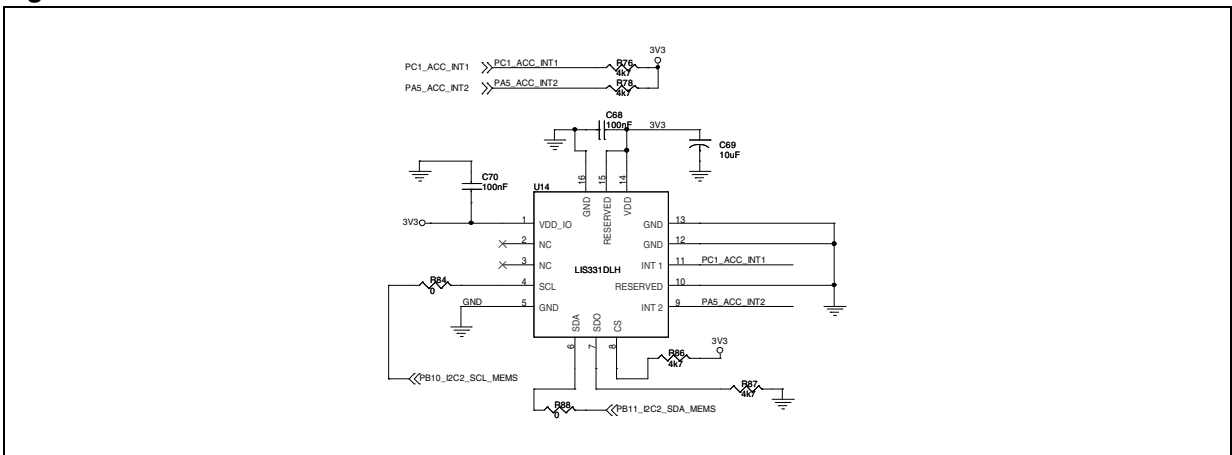


Figure 19. Accelerometer section



## 2 Revision history

Table 1. Document revision history

Date	Revision	Changes
25-Oct-2012	1	Initial release.

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