

To: LFEVY42016 Team
From: Geoff Nudge
Date: 5/9/2016
Subject: Accumulator Errata

This memo lists all known errata regarding the TSV accumulator. Suggestions are made to correct these items.

PacMan

The PacMan computer occasionally resets when AIRs close and when LCO cable is connected/disconnected. The LCD display also changes the displayed screen in this scenario. This is likely due to input pins on the Atmel AVR AT90CAN128 that are connected to the 16 pin connector without any protection or device connected (to allow for future development). Cutting traces or adding protection should alleviate the problem.

A zener diode and CAN resistor should never be populated (see attached annotated schematic).

CAN GND should not be connected to PacMan ground plane (see attached annotated schematic).

CAN addresses and calibration factors are not able to be modified via the control panel.

AMS

The AMS PIC processor is bricked when the function `ams_set_bypass_time` in `i2c.c` is called. The reason for this needs further investigation.

Calibration factors should be moved from PacMan software to AMS firmware.

Mechanical

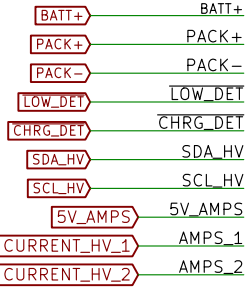
PacMan standoffs should be replaced. They are currently bolts and nuts tightened down to the pcb. Proper standoffs should be used.

The hole for the pack alive LED is slightly too small. It should be drilled out larger by the shop.

The garolite that PacMan is mounted to has threaded inserts that accept bolts from the top of the pack. These inserts tear out easily and should be held in with an adhesive.

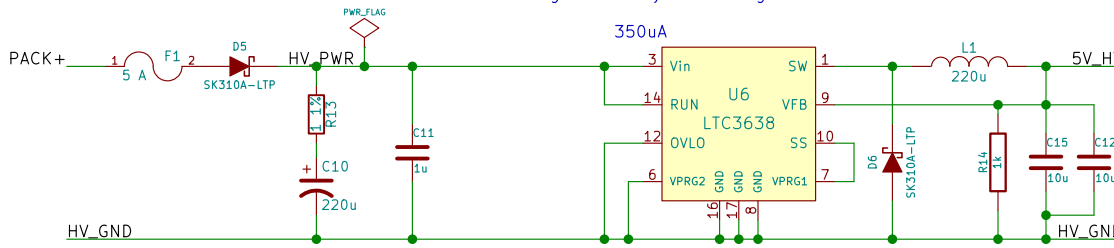
The aluminum plate that separates cells 3 and 4 is too tall and must be cut shorter to allow for the aluminum bar wire to connect these cells.

HIGH VOLTAGE INTERFACES



HIGH VOLTAGE POWER

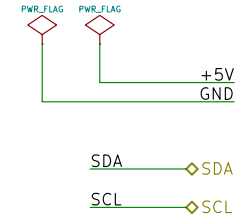
This power supply is responsible for delivering non-isolated 5V power to the high voltage electronics. All AMS bus connected devices are powered from this regulator. Maximum current draw 250mA. This Switcher was selected for its high efficiency even at light load.



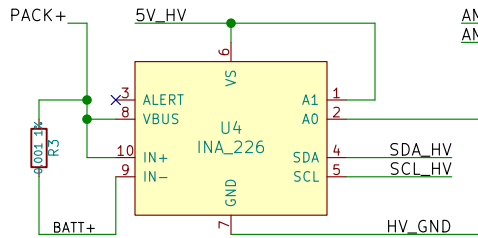
HIGH VOLTAGE



LOW VOLTAGE



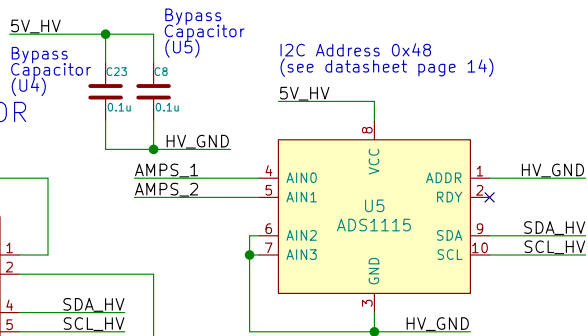
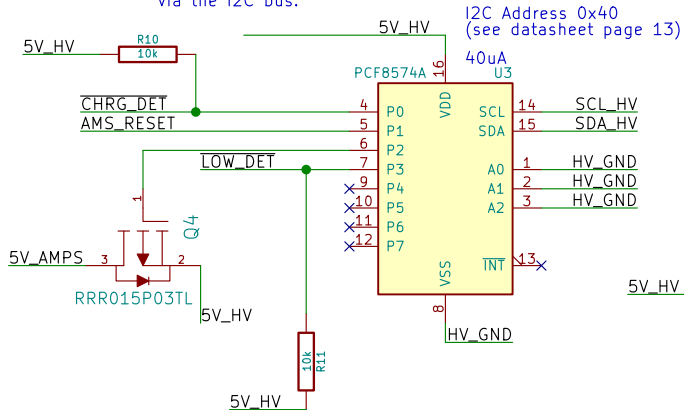
PACK VOLTAGE SENSOR AND CHARGE SENSOR



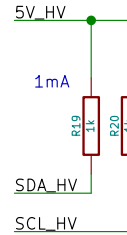
I2C Address 0x44 (see datasheet page 18) Additional documentation of the use of this component is req'd.

HIGH VOLTAGE DIGITAL I/O

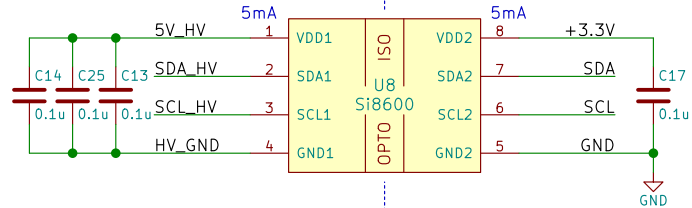
This I/O expander is responsible for relaying digital signals across the HV-LV isolation barrier via the I2C bus.



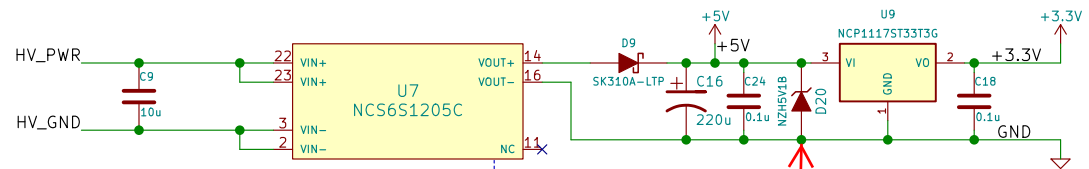
I2C PULLUP



I2C ISOLATOR



HIGH VOLTAGE LOW VOLTAGE



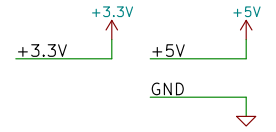
The flyback regulator responsible for delivering 5V isolated power to low voltage systems has been replaced with an isolated DC/DC converter. This is due to the insufficient output current (300mA) available when assembled. Cost is comparable.

Maximum Current Draw on 5V output: 1.2A

This zener diode is not needed now that the flyback converter is not being used.

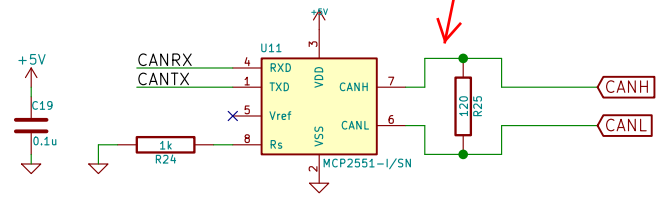
DEVELOPMENT ONLY
 Engineer: Geoff Nudge
 Supervisor: Christopher Nadovich
 Fall Semester 2015
Lafayette College
 Sheet: /Isolated Power Supply/
 File: power.sch

GROUNDING LOW VOLTAGE



CANTXD — CANTX
CANRXD — CANRX

CAN TRANCEIVER

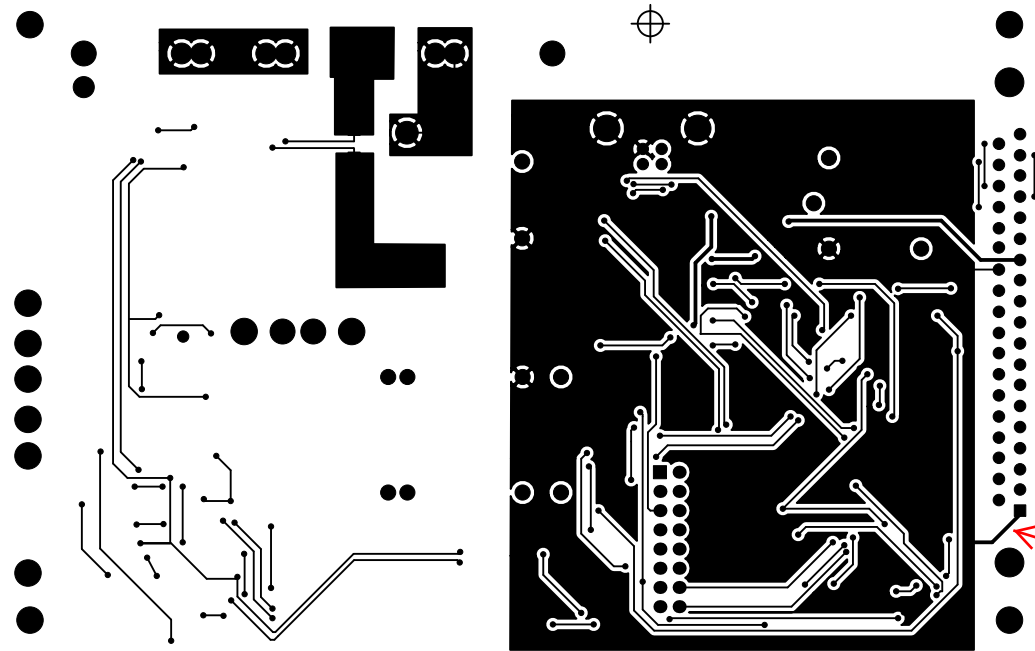


NEVER
POPULATE

NOTE: DO NOT populate R26.

R26 provides the ability to use this board
as a terminating CAN node in development only.

DEVELOPMENT ONLY	
Engineer: Geoff Nudge	
Supervisor: Christopher Nadovich	
Fall Semester 2015	
Lafayette College	
Sheet: /CAN Transceiver/	
File: can_xcvr.sch	
Title: Battery Pack Management Computer	
Size: USLetter	Date: 2016-04-01
KiCad E.D.A. kicad 4.0.2-4+622538ubuntu14.04.1-stable	Rev: 0.5
	Id: 4/6



This connection between CAN GND and the ground plane should be removed.

Spring 2016		
Supervisor: Chris Nadovich		
Engineer: Geoff Nudge		
Lafayette College ECE		
Sheet:		
File: pacman-main.kicad_pcb		
Title:		
Size: A4	Date: 2016-03-16	Rev: 0.4
KiCad E.D.A. kicad 4.0.2-4+622538ubuntu14.04.1-stable		Id: 1/1