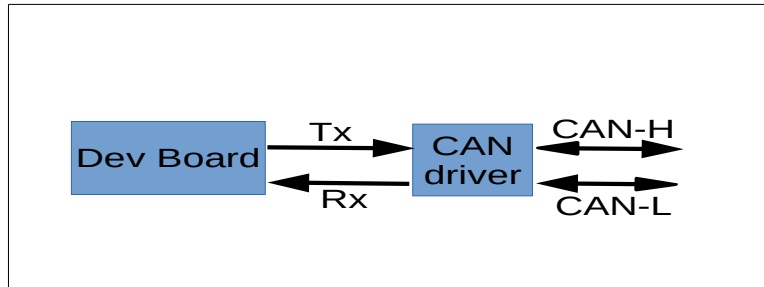


OpenLCB/LCC CAN Driver Board Manual

2015.11.20

The OpenLCB CAN Driver Board (board for short) is designed to connect to a number of development/demo boards which are available for a number of processors. These are often very cost effective, but usually do not include a CAN driver chip.



Here is a partial list of dev boards:

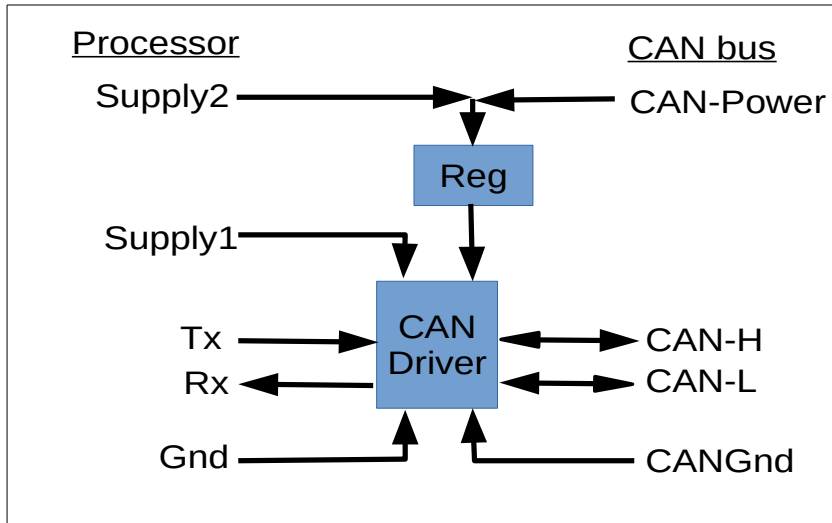
Board	CAN channels	Driver included	Comments
Tiva TM4C123/LM4F120XL	1	No	\$13, USB
Tiva TM4C1294	2	No	\$20 USB, Ethernet
NXP LPC1768/9 / mbed	2	No	\$50, USB, Ethernet
NXP LPC11C24	1	Yes	M0, LPCXpresso \$27
TI STM32F072	1	No	M0, Discovery \$15, Nucleo \$15
TI STM32F103	1	No	M3, Discovery, Nucleo \$11
TI STM32F303/334	1	No	M4, Discovery \$11/18, Nucleo \$11
TI STM32F4xx	2	No	M4, Discovery \$15, Nucleo \$11
Freescall			
Microchip PIC32	1	No	?
Beaglebone Black	2	No	AM335x Cortex-A8, \$45

Options:

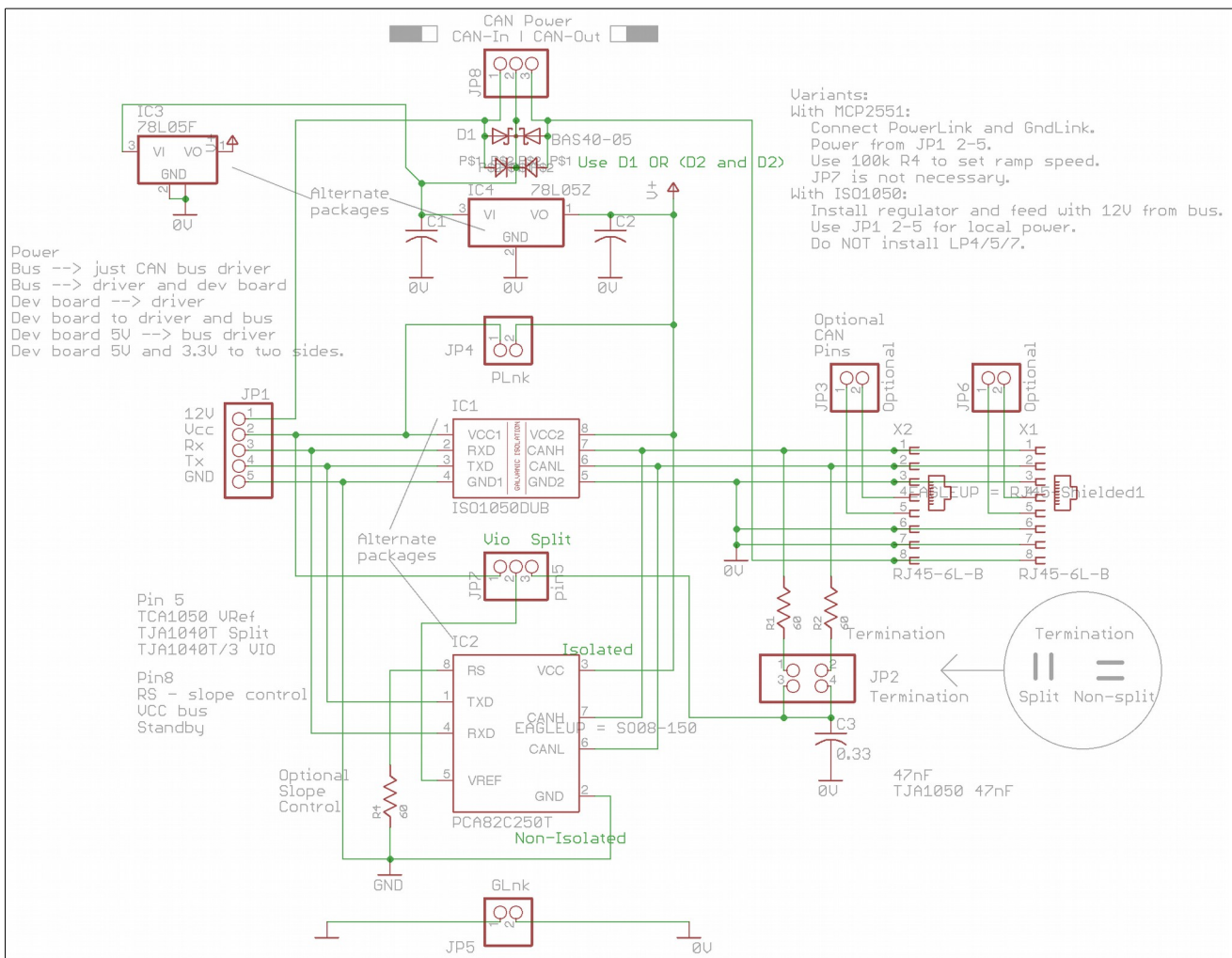
The board is designed to be very flexible, and therefore it has some options, which depend on the power supplies available, the microprocessor supply, etc. Here is a list of the options:

1. Can be used with 3.3V or 5V microprocessors;
2. Can use a number of CAN driver chips:
 - a. ISO1050 – isolated driver, required two power supplies;
 - b. MCP2551 – basic 5V driver;
 - c. MCP2562 – split supply driver;
 - d. TJA1051T/3 – split supply driver.
3. Allows power to be sourced from the CAN bus;
4. Allows power to be supplied to the CAN bus;
5. Supports simple or split bus termination.
6. Can use through-hole or smd passive components.

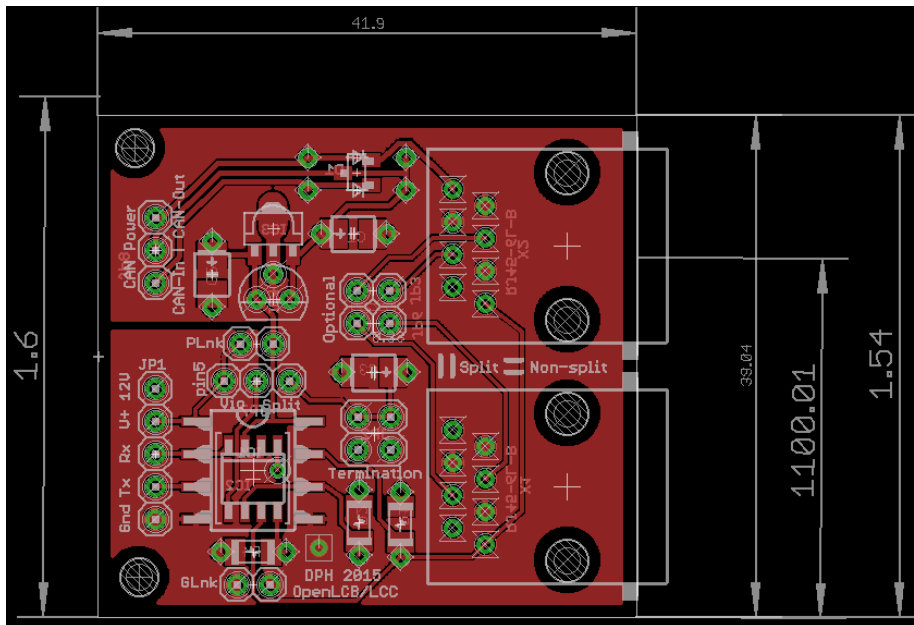
Here is a rough block diagram of the board.



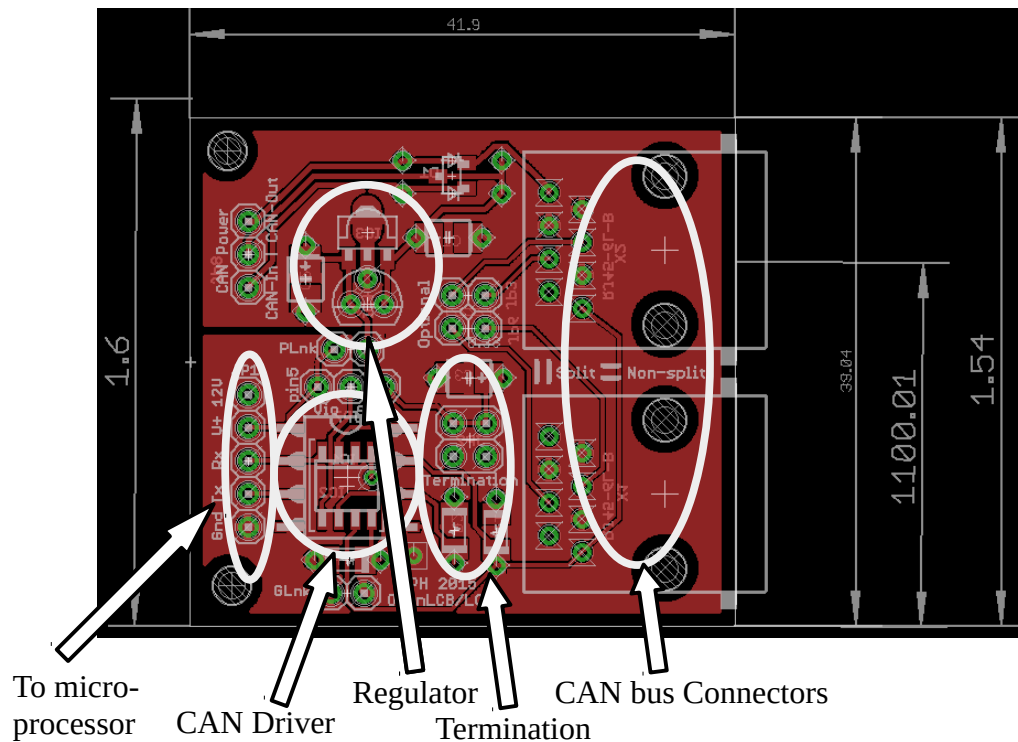
Here is the schematic:



Here is the board layout:

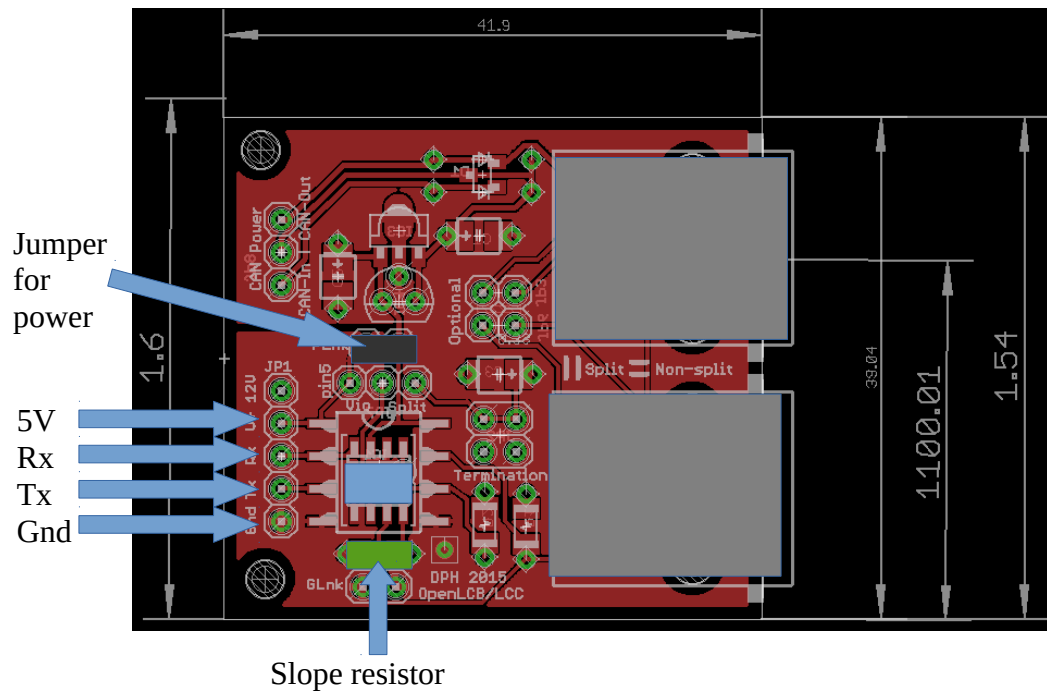


Here is the general layout:

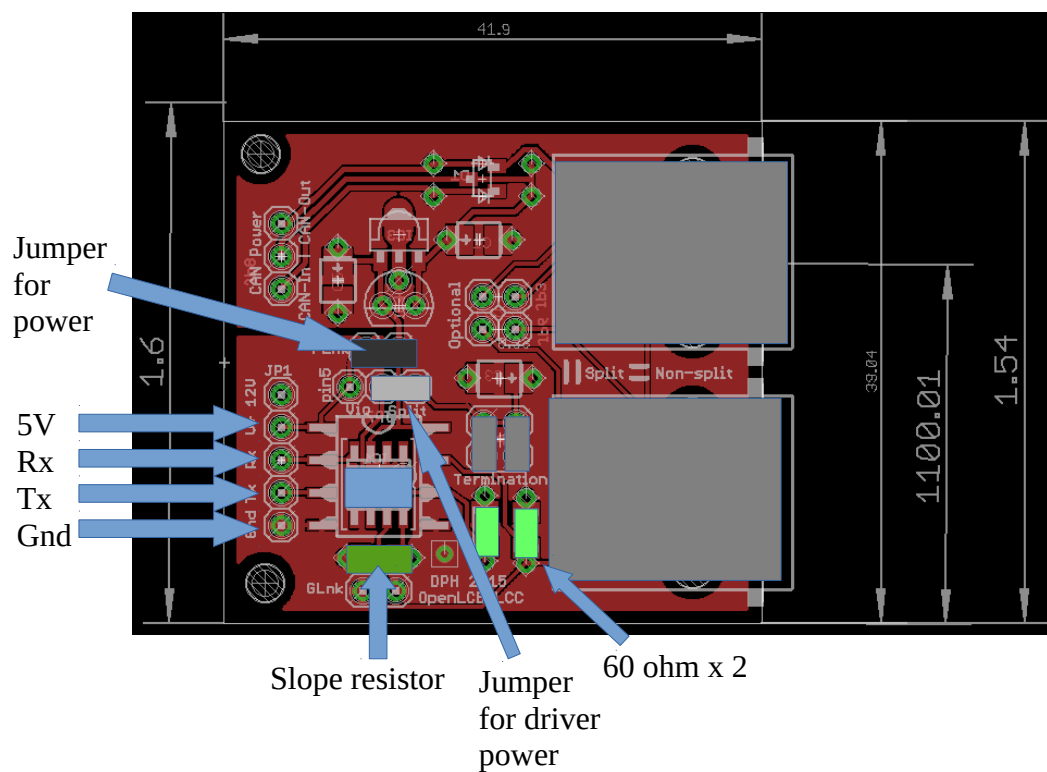


Applications:

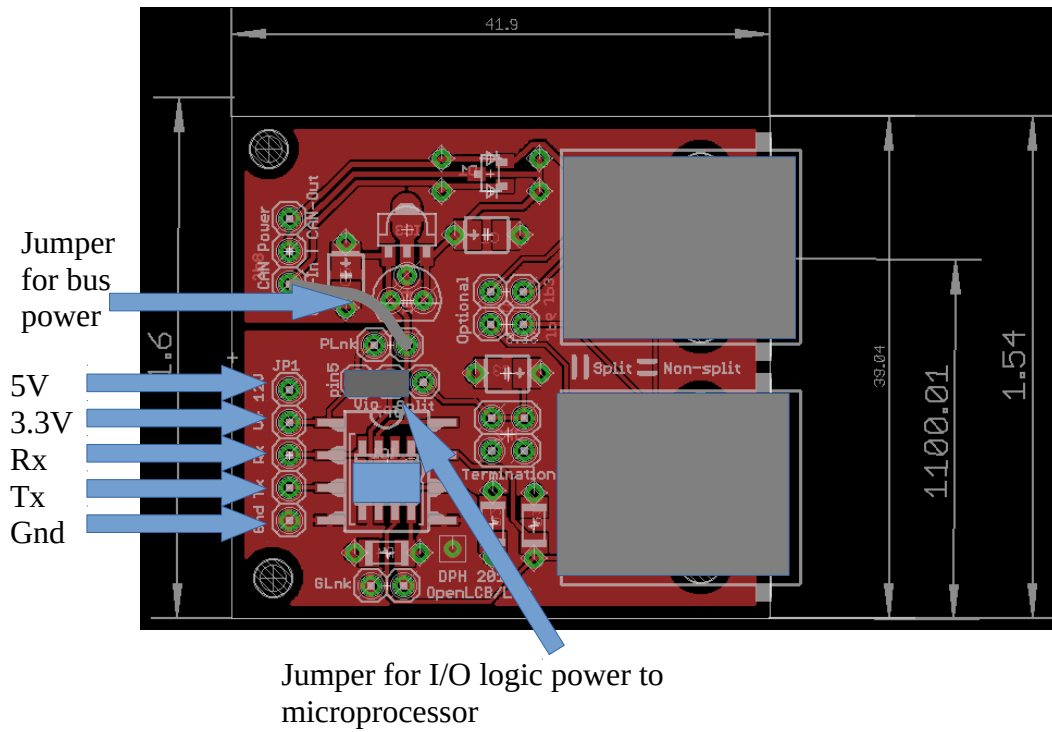
MCP2551:



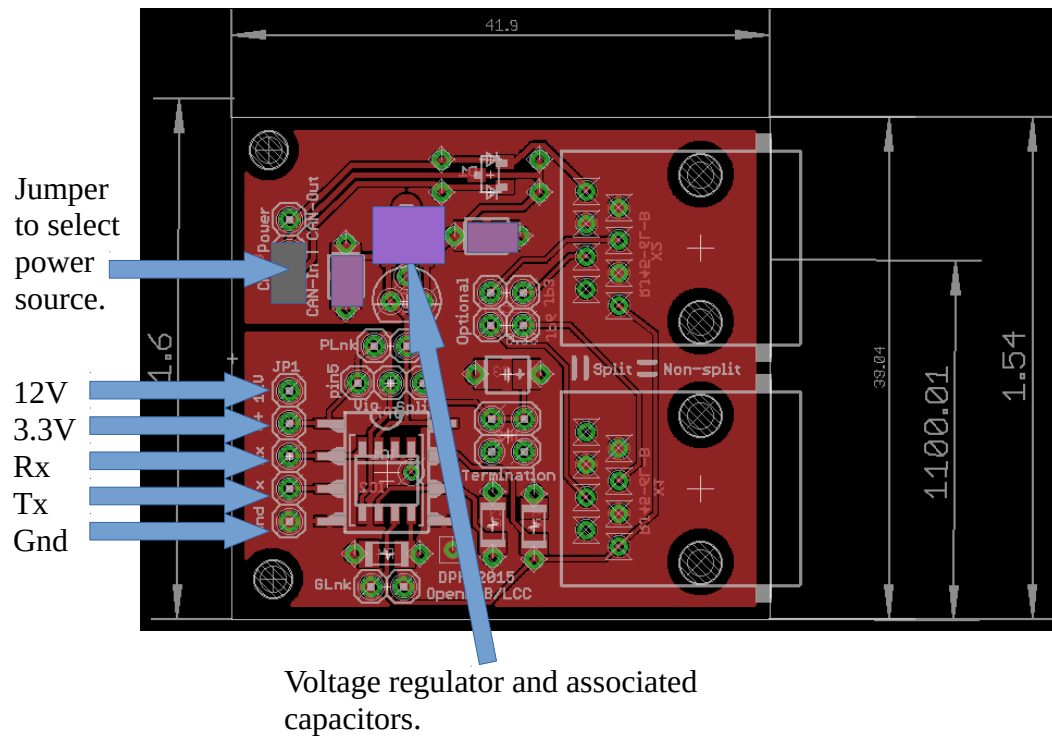
MCP1551 with split termination:



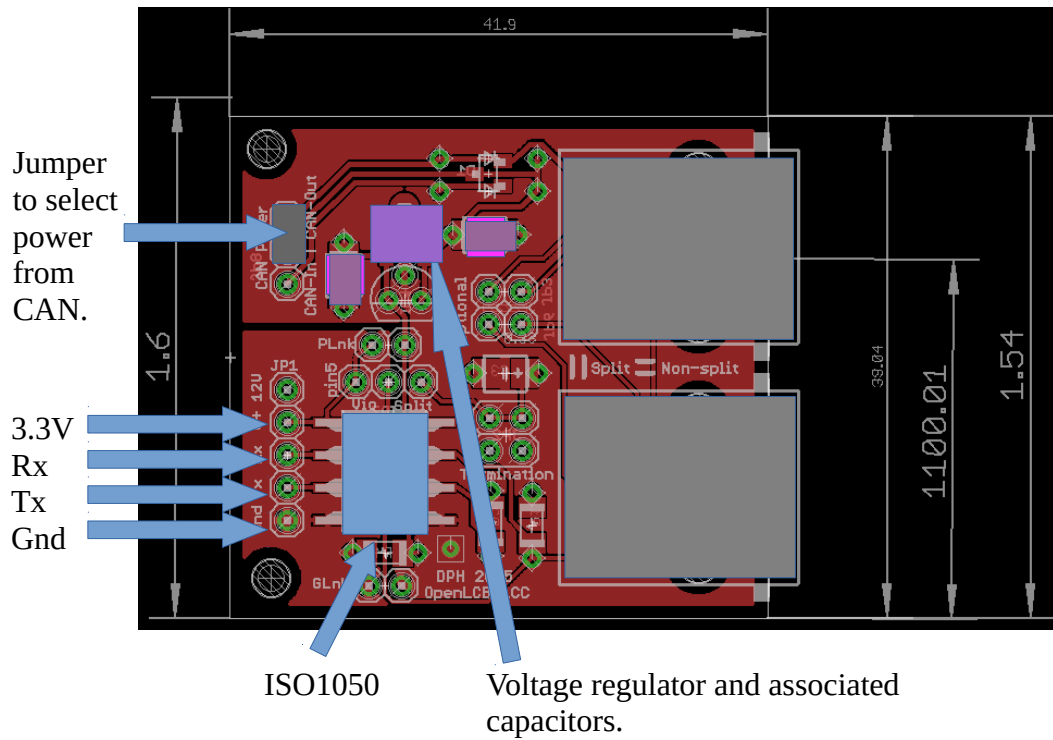
MCP2562:



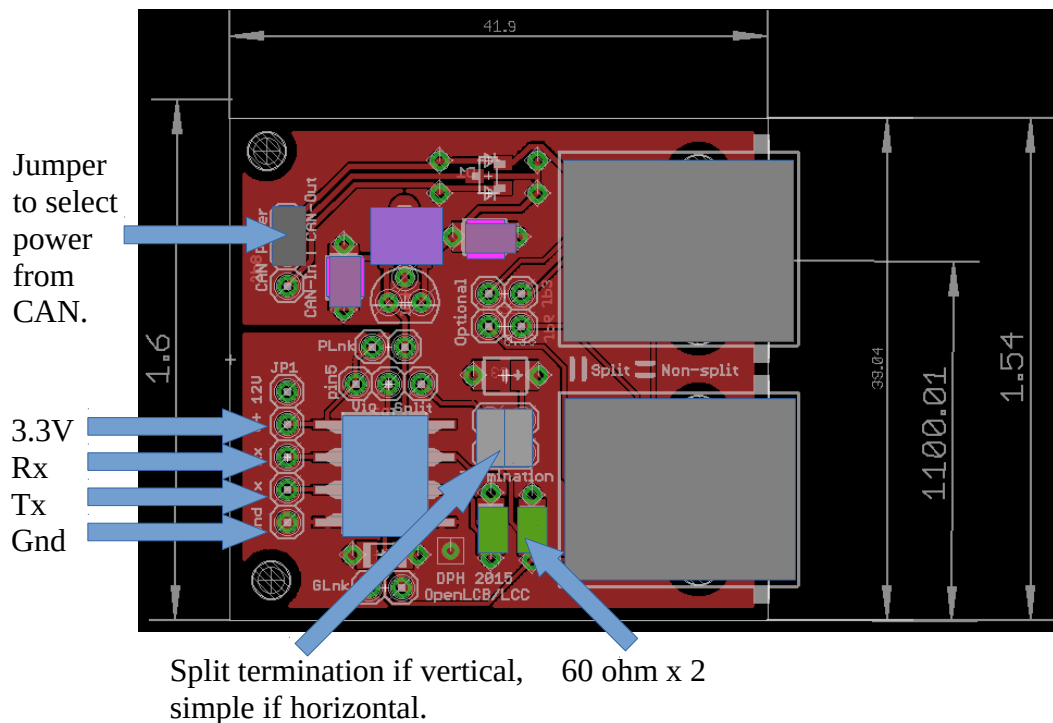
Supplying 5V from 12V:



Using ISO1050:



ISO1050 with split or simple termination:



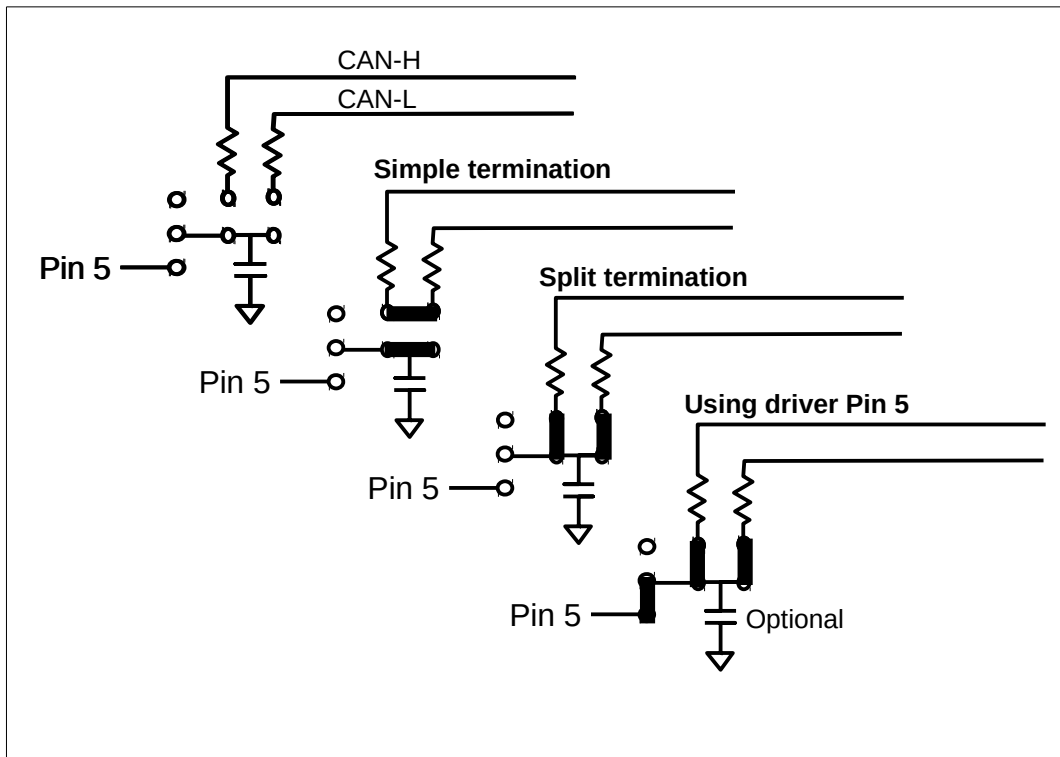
Termination:

The CAN bus requires bus terminations at each end of the bus. These are specified to reduce reflections from the bus ends, and therefore reduce noise and collisions on the bus. The usual termination recommended is 120 ohms across the CAN-L and CAN-H lines.

Others have recommended using split-termination, which is designed to reduce common-mode noise (noise that is similar on CAN-L and CAN-H). This splits the 120 ohm resistor into two 60 ohm resistors in series, and connecting the midpoint to ground through a capacitor. An alternate arrangement is to connect the midpoint to a 'virtual ground' – some chips supply a specific pin (usually pin 5) that is a Vref or Vsplit.

The board supports all of the above schemes:

- (1) The board is designed to take two 60 ohms resistors;
- (2) These can be connected (or not) to a capacitor to ground via the 2x2 pinheader;
- (3) Their midpoint can be connected to pin 5 (Vref, Vsplit) via the 1x3 pinheader.



ERRORS:

1. There is a known error on the original version of the pcb. Pins 4&5 of the RJ45s are supposed to be in parallel. Unfortunately, they were crossed. Your pcb should come with a correction, which is a patch with crossed wires. If you should want to use those pins, you will need to cut those wires to access the pins.

