

Mixed Signal PCB Design Requirements Sheet

Task Description

Central Controller Board

You are to create the:

- Schematic
- Followed by Board Layout

For a central controller board that can be incorporated into a product. The schematic and board layout can be done with any design software you are comfortable with (though we prefer Altium or Mentor Graphics PADS).

Components and Interfaces:

- MicroController:
 - STM32F407 Controller with Debugger on STM32F103.
- Communication Interfaces:
 - Ethernet (Transfer Speed: 2MB/s) ○ USB 2.0 ○ CAN Bus (Transfer Speed: 1MB/s), UARTs
- Other components:
 - The controller board also hosts a 24-bit ADC: ADS122C04IPW with external reference and clock, PGA 128, Sample Rate: 100SPS. This ADC measures an input that has a differential voltage range of 0-10mV (with CM Voltage of 2.5V)
 - The controller board also has the ability to run 2 bi-directional motors (with varying duty cycle of 0-100%) with a Power Rating of 36W (12V 3A) each. The board must host the switches and connectors to make this possible. (*Here we'll use DRV8701 motor Driver with Mosfet Bridge)
 - Stereo DAC w/Headphone & Speaker Amps using I2C interface.
 - Microphone which will be connected to Codec.

The Following devices/chips can be selected at your discretion.

- All Phys.
- Voltage References, Regulators and Clocks.
- All Discrete components.
- All Power Switches.
- All Connectors.

