

# Mr. Truman: An Embedded Friend

Team 5

Maxwell Strange, Eric Heinz, Spencer Fricke

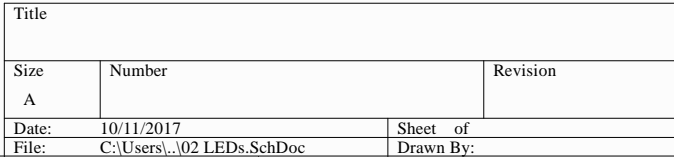
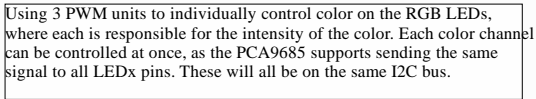
## Table of Contents:

Page:	Contents:
01	Title Page
02	LED Drivers
03	Power Schematic
04	Dragonboard Interface
05	Servo and Fan w/ PWM Driver
06	Gyroscope
07	Audio
08	Camera
09	LEDs

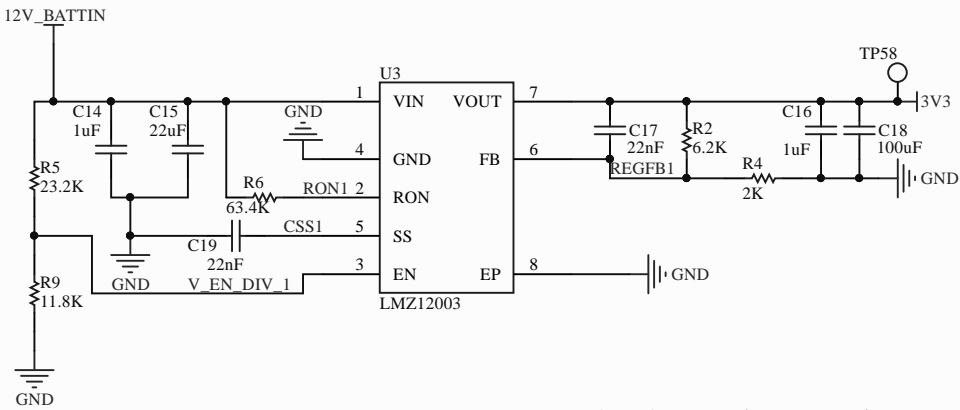


Title		
Size A	Number	Revision
Date:	10/11/2017	Sheet of
File:	C:\Users\...\\01 TITLEPAGE.SchDoc	Drawn By:

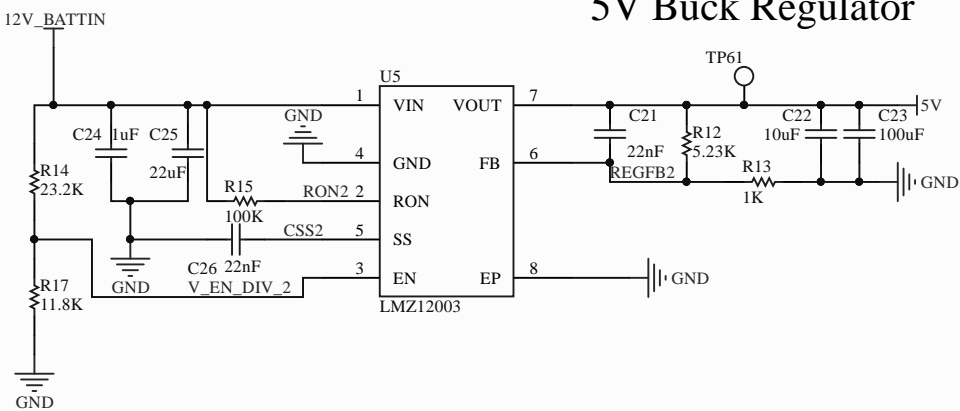
## D



POWER

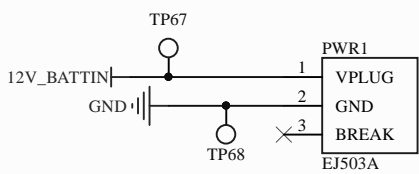


3V3 Buck Regulator

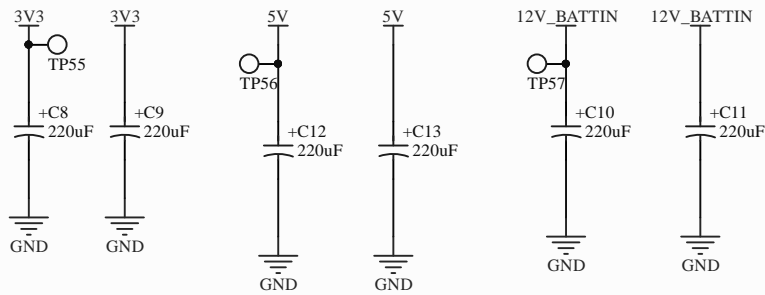


5V Buck Regulator

Wall Connection

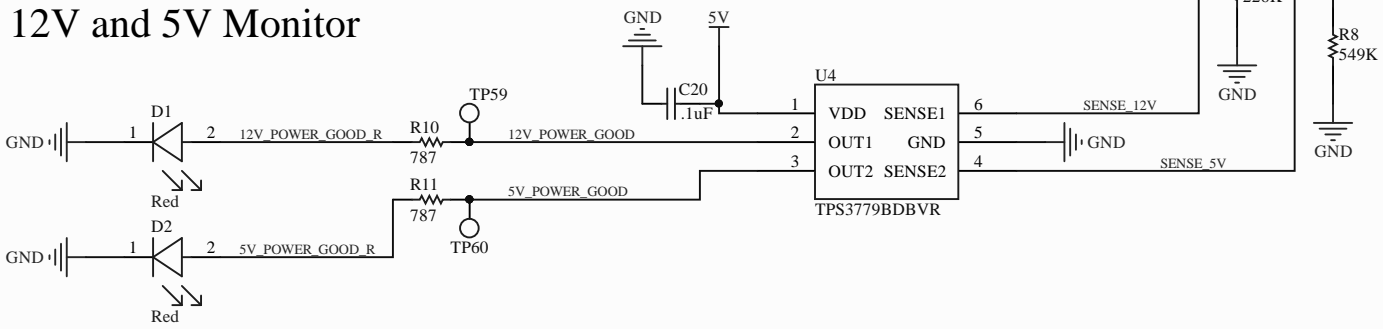


Basic power stuff for voltage regulators and monitors.

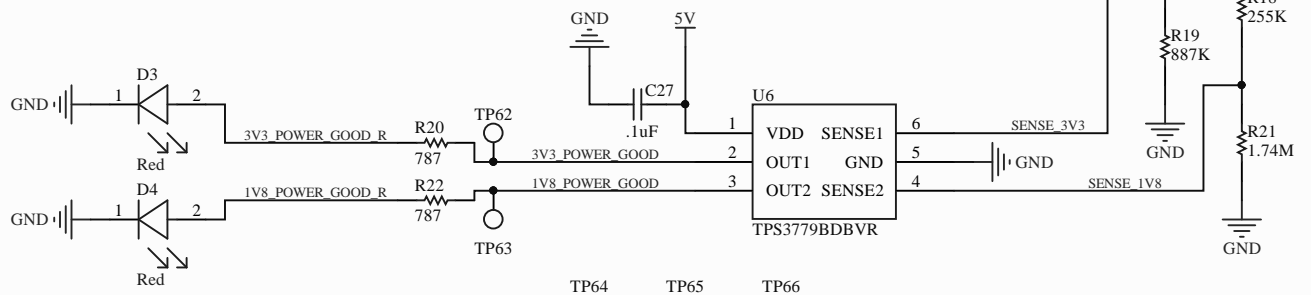


Bulk Capacitance

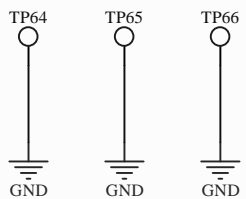
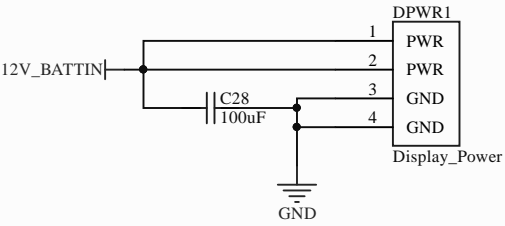
12V and 5V Monitor



3V3 and 1V8 Monitor



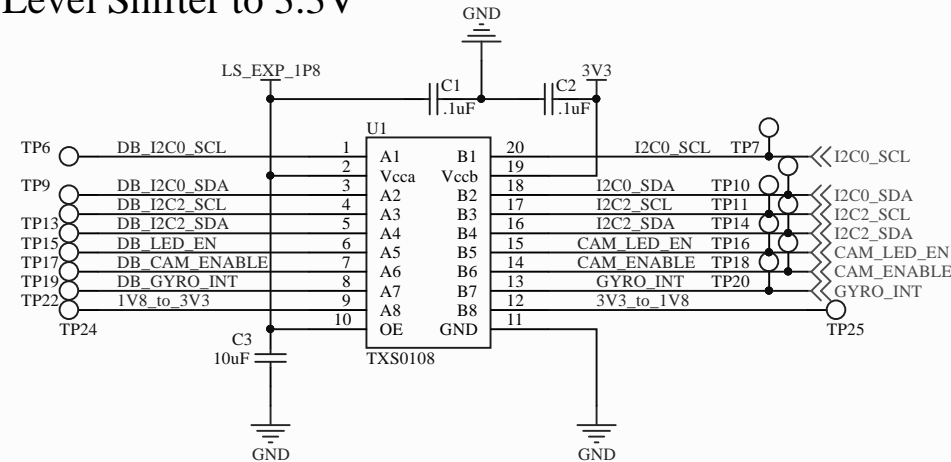
Connection to power the display



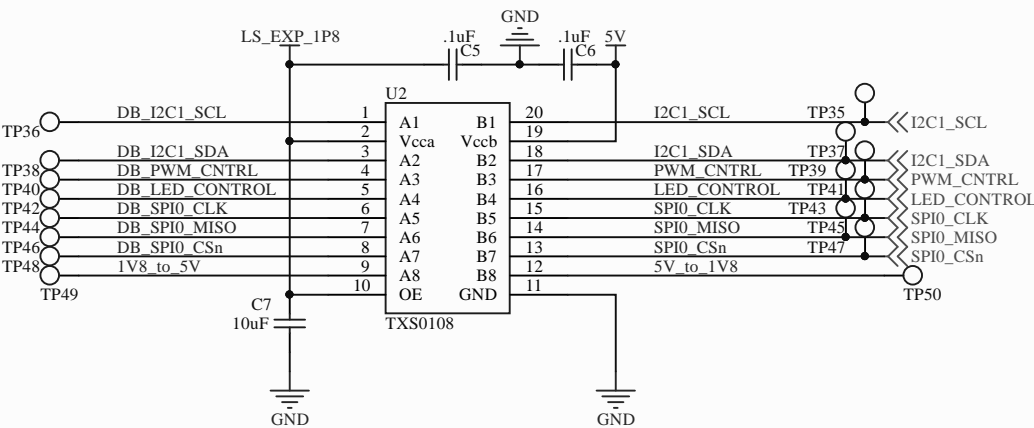
Title		
Size	Number	Revision
A		
Date:	10/11/2017	Sheet of
File:	C:\Users\...\03 POWER.SchDoc	Drawn By:

DRAGONBOARD INTERFACE

Level Shifter to 3.3V

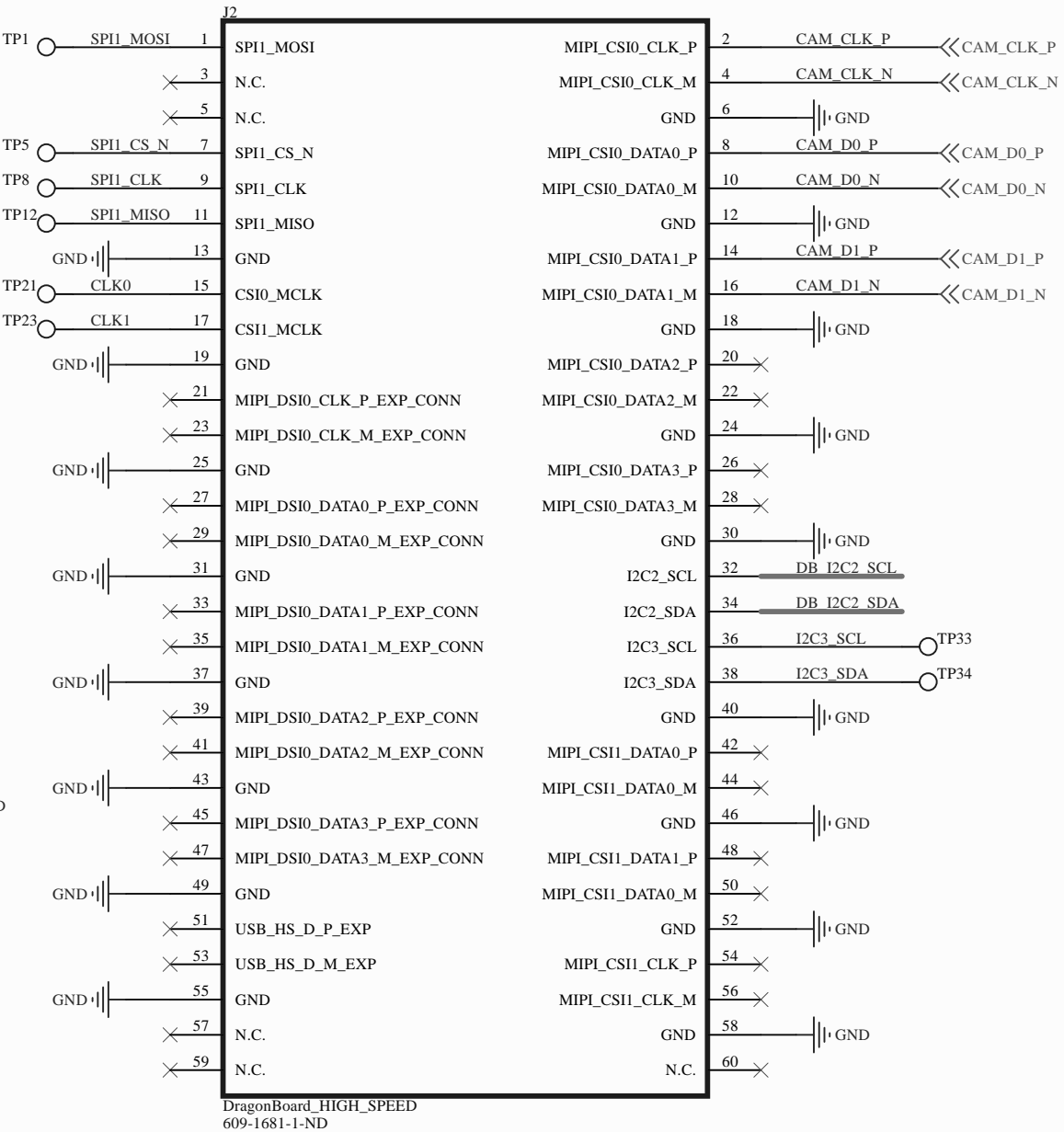
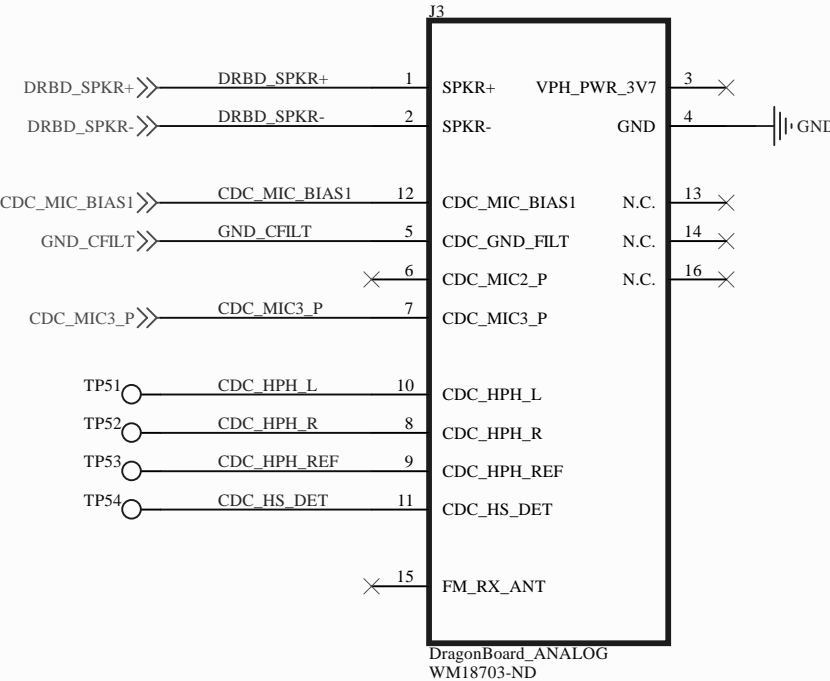
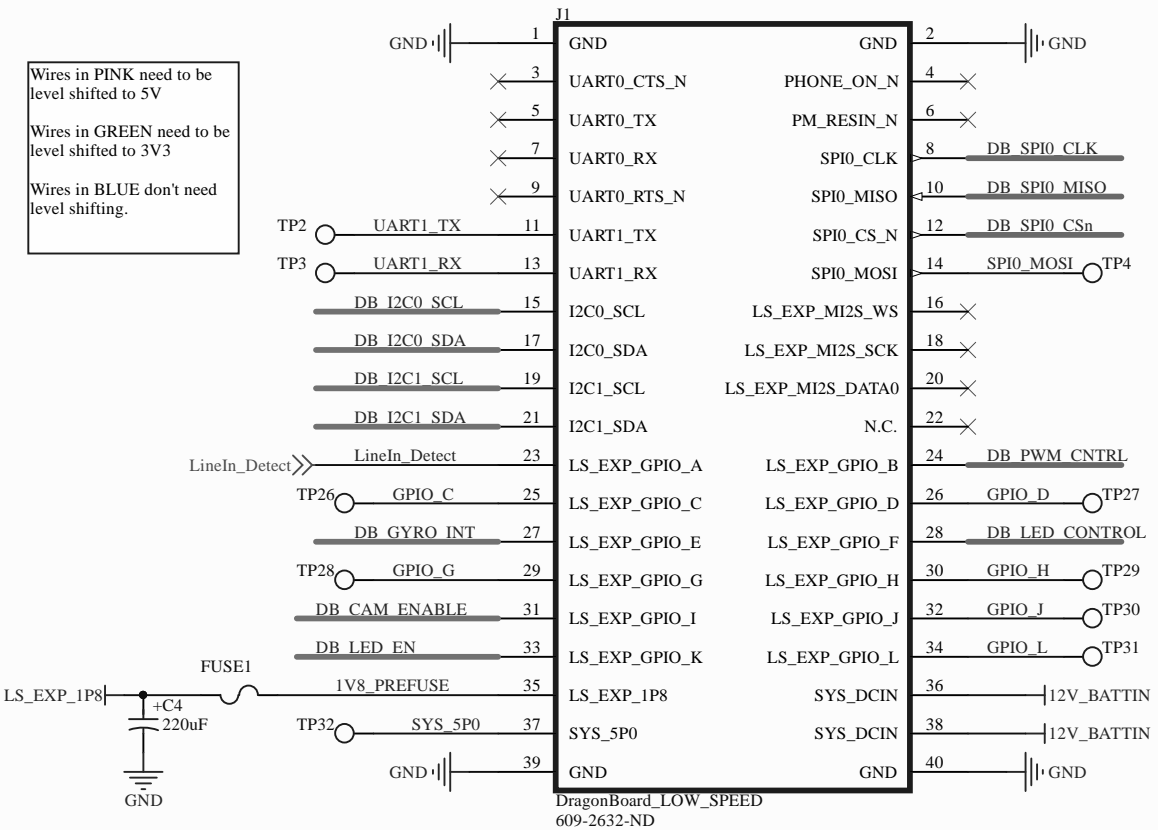


Level Shifter to 5V



This schematic contains the three connectors to the dragonboard as well as the necessary level shifters to the peripheral ICs.

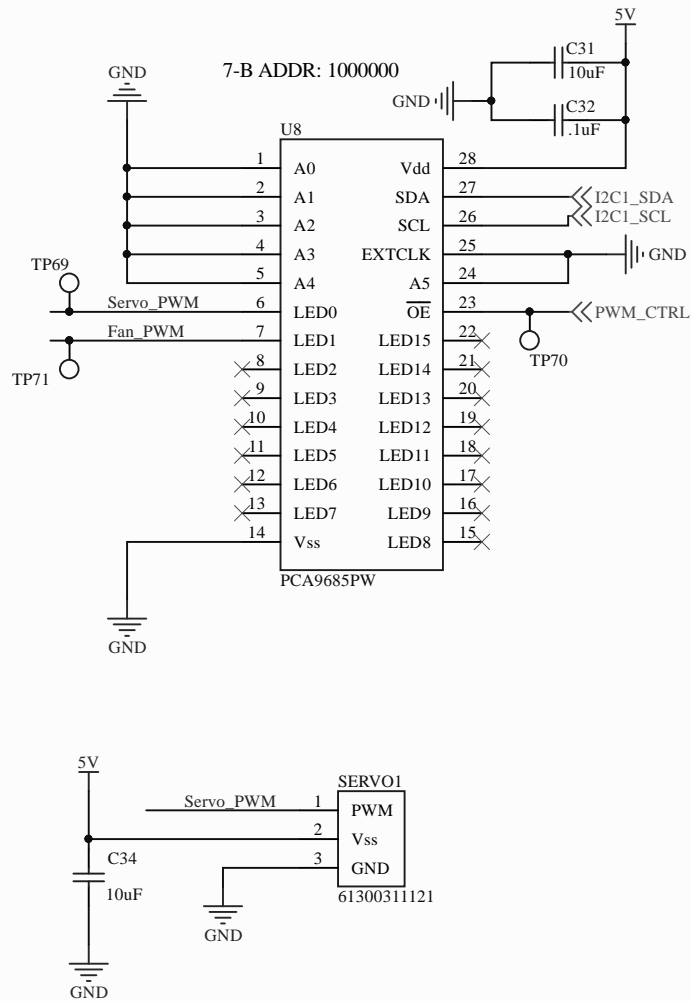
Wires in PINK need to be level shifted to 5V  
Wires in GREEN need to be level shifted to 3V3  
Wires in BLUE don't need level shifting.



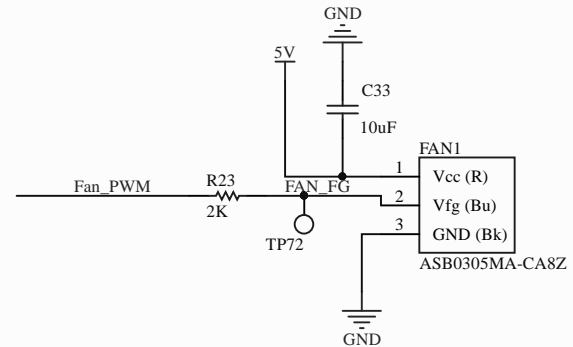
The CSI pins are to be directly connected to the dragonboard without levelshifting. All other voltages must be shifted to be compatible with our devices.

Title		
Size	Number	Revision
A		
Date:	10/11/2017	Sheet of
File:	C:\Users\...\04 DragonBoard_INTF.SchDoc	Drawn By:

# SERVO+FAN



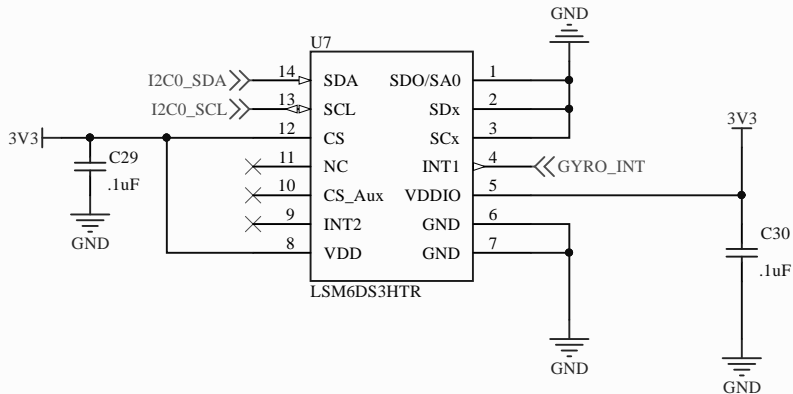
Using the same PWM driver that we are using to control the LEDs to control the servo and fan, since there are push-pull outputs on the PCA. The servo is used to extend the speakers



Title		
Size	Number	Revision
A		
Date:	10/11/2017	Sheet of
File:	C:\Users\...\05 SERVO_FAN.SchDoc	Drawn By:

# GYROSCOPE

7-B ADDR: 1101010



The gyroscope will be used to detect rotation of the device as well as provide information via its built in temperature sensor. The chip can be configured to generate an interrupt upon a certain rotation.

Title

Size

Number

Revision

Date: 10/11/2017

Sheet of

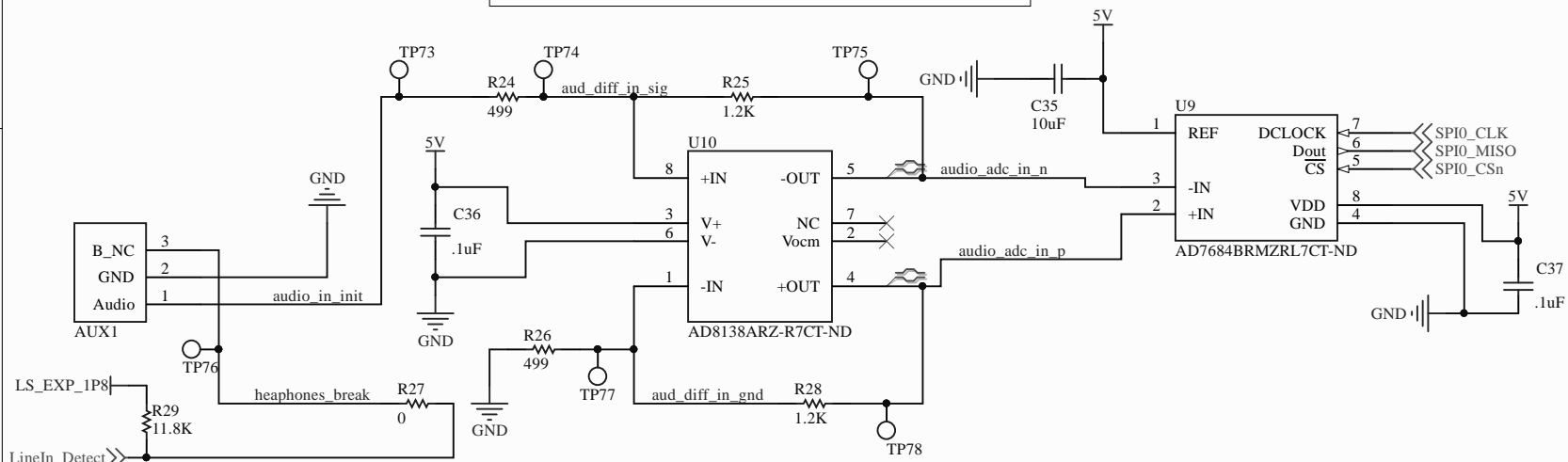
File: C:\Users\...\06 Gyro.SchDoc

Drawn By:

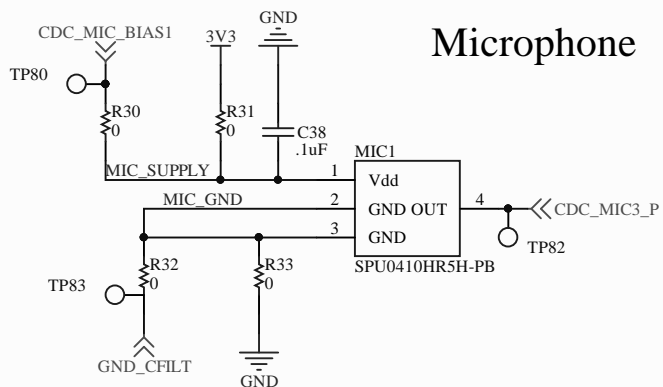
# AUDIO

Sample line audio here into the dragonboard. First is an amp to take the single ended audio input (measured about 1.4V p-p at maximum volume from iphone 6s plus.) to a differential voltage about 2.5V to handoff to a 100KSPS ADC to then be transferred into the dragonboard via a 3-Wire SPI connection and processed in software.

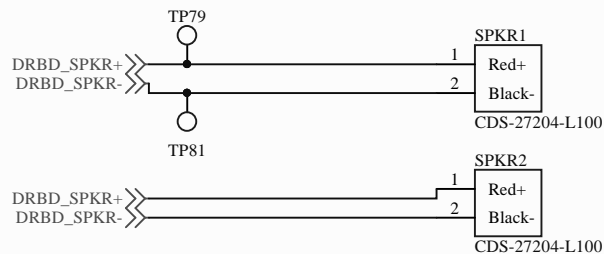
## Line In



## Microphone

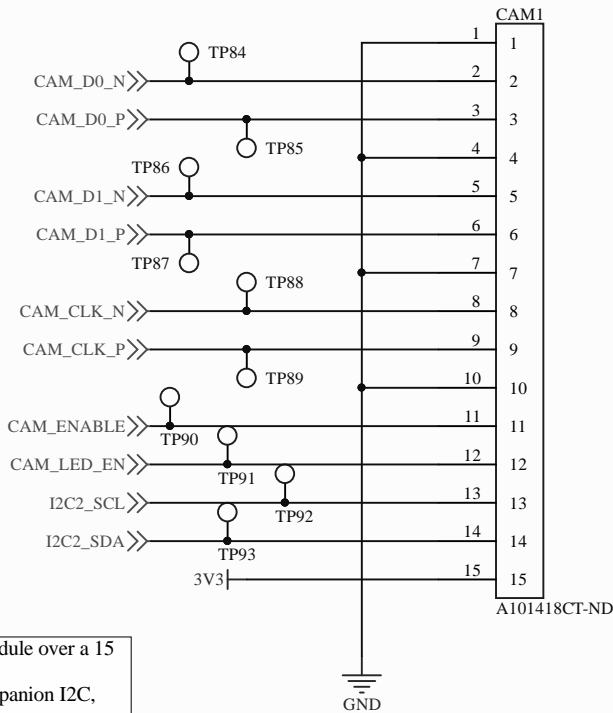


## Speakers



Title		
Size	Number	Revision
A		
Date:	10/11/2017	Sheet of
File:	C:\Users\...\07 Audio.SchDoc	Drawn By:

# CAMERA

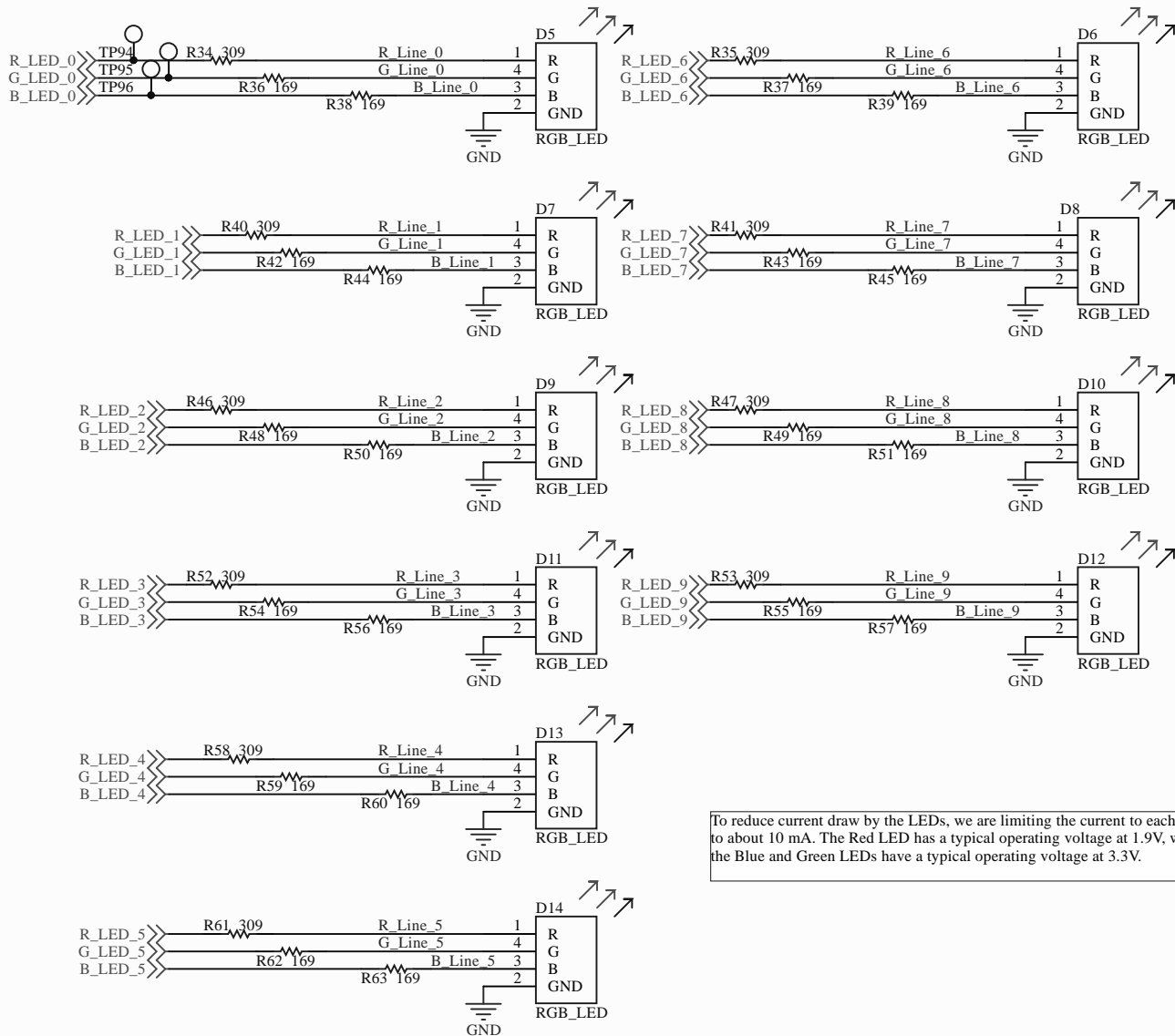


This is the connection to the camera module over a 15 pin FPC ribbon cable.  
There are two data lanes, a clock, a companion I2C, and power.

Title		
Size	Number	Revision
A		
Date: 10/11/2017		Sheet of
File: C:\Users\...\08 Camera.SchDoc		Drawn By:



# LEDs(2)



To reduce current draw by the LEDs, we are limiting the current to each LED to about 10 mA. The Red LED has a typical operating voltage at 1.9V, while the Blue and Green LEDs have a typical operating voltage at 3.3V.

Title		
Size	Number	Revision
A		
Date:	10/11/2017	Sheet of
File:	C:\Users\...\09 LEDs(2).SchDoc	Drawn By: