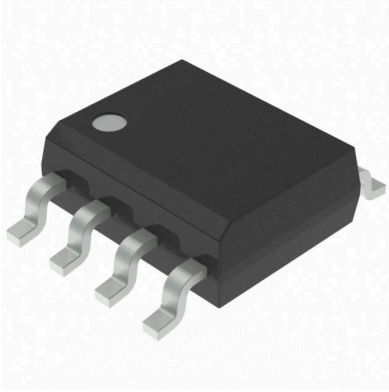
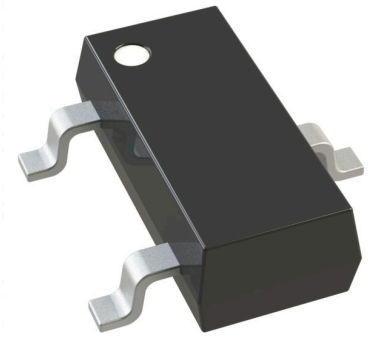
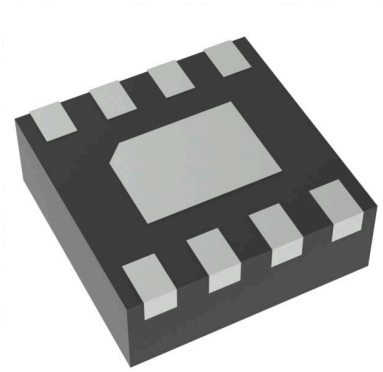
Team 208 Component Selection

Major components

Barrel Jack (Digikey)
12V Battery (Digikey)
Voltage Regulator (Digikey)

Temperature Sensor

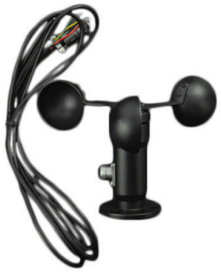
Solution	Pros	Cons
Option 1: AT30TS74-SS8M-B  Digital Temperature Sensor, Local -55°C ~ 125°C 11 b 8-SOIC $0.82/each Link to Product	• High operating temperature range (-55 C ~ 125C) • Uses I2C Serial Interface • Configurable temperature limits • Inexpensive	
Option 2: MCP9700T-E/TT  AnalogTemperature Sensor, Local -40°C ~ 125°C 10mV/°C SOT-23-3	• High operating temperature range (-40 C ~ 125C) • Inexpensive	• Analog output, requires ADC • +/- 6 degree accuracy

$0.30/each Link to Product		
Option 3: NCT75MNR2G  Digital Temperature Sensor, Local -55°C ~ 125°C 11 b 8-DFN (2x2) $0.83/each Link to Product	• High operating temperature range (-55 C ~ 125C) • Accuracy of 1°C	• Voltage supply of 3V -5.5V

Choice: AT30TS74-SS8M-B
Rationale: The AT30TS74-SS8M-B has a high operating temperature range, makes use of I2C which satisfies a course requirement and has good documentation to facilitate working with it.

Wind Speed Sensor

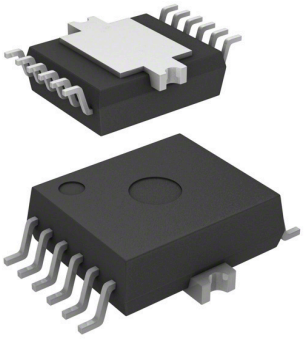
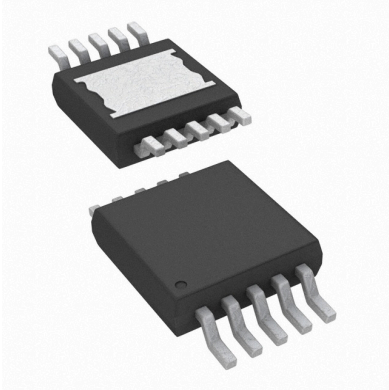
Solution	Pros	Cons
Option 1: 1528-1328 (1733)  Adafruit Wind Speed Sensor Analog Voltage Output $44.95/each Link to product	• Accuracy of +/- 0.3 m/s • Measuring range of 32.4m/s • Compact size, easy to carry, easy to install	• Expensive • Volt. Regulator needed • 7-24V voltage range (9V Recommended) • Note: not many info in the datasheet
Option 2: SEN0483	• Accuracy of +/- 0.3 m/s	• Expensive • Supply voltage 7- 24V

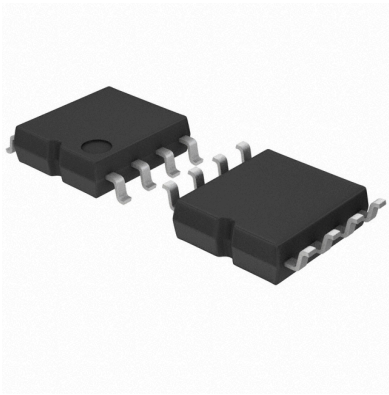
 Wind Speed Sensor Analog Output $45/each Link to Product	• Measuring range of 32.4m/s • Compact size, easy to carry, easy to install	
Option 3: DWS-V-DAC13  Wind Velocity Sensor $1,696.70 Link to product	• It is used in many applications •	• Expensive • 10 - 28 V

Choice: Adafruit 1733

Rationale: Despite the lack of a readable datasheet (available in Chinese), the Adafruit 1733 has a ton of external documentation and use cases to provide a smooth use and easy debugging.

Motor Driver

Solution	Pros	Cons
Option 1:  IFX9201SGAUMA1 $4 Each Link to Product	• Experience with it in class. • Work with 3.3V (what we intend on using) • Has a very good data sheet • Low standby current	• Most expensive option. • It has many pins (can be difficult to solder)
Option 2:  A3909GLYTR-T $1.50 Each Link to Product	• Most inexpensive option. • 1A for output current • Supply Voltage at 12V • Very good datasheet.	• No experience with this option • Has many pins (may be difficult to solder) • Power supply at 4V when we are using 3.3V • Does not show SPI channels
Option 3: •	• Not as expensive as option 1	• No experience with this option

Solution	Pros	Cons
 BD6221F-E2 $2.74 Each Link to Product	• Has the least pins, it may be easier to use or set up. • May be easier to solder than other options. • Vref 3-15V	• Does not show SPI channels • Not a very good datasheet (does not tell you how to work with it)

Choice:IFX9201SGAUMA1
Rationale: This seems like the best option for the application because we already are working with it, although it is the most expensive option and has the most pins, I believe already knowing how it works cancels all that out.

Motor

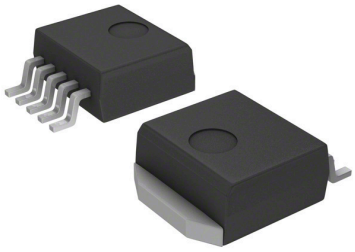
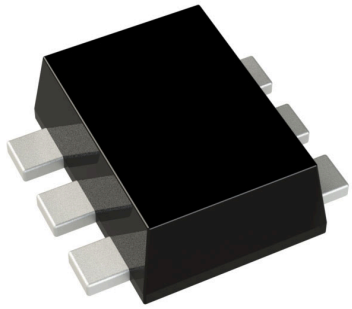
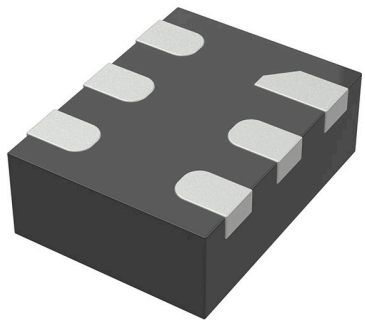
Solution	Pros	Cons
Option 1:  M1N10FB11G $3.38 Each Link to Product	• Very easy to get/inexpensive • Has a good operating voltage (1-5v) • A fast motor which gives us more speeds to work with.	• Very high starting current (874mA) • 5V Rated Voltage • Motor is most efficient around 500mA
Option 2:	• Has a operating voltage around 3V • Inexpensive • Stall Current at	• Torque is concerningly low, may not be able to spin anything too quick (for our

 VQ4TL2BQ380001 $3.61 Each Link to Product	130mA • Starting Voltage 2V	application this is very important)
Option 3: PKN12EB105C1  $3.99 Link to Product	• Power rated at 2.2 W • Most efficient at 290mA • Current at Max Power is 500mA	• Most expensive option • It is small • Not as quick as other options

Choice:PKN12EB105C1

Rationale: Although the motor is very small, because we are flexible with the material of our project we can possibly implement smaller blades so we could use the small motor. This option also seems to be the most efficient compared to the other two options and seems more friendly toward our constraints.

Solution	Pros	Cons
	• It is the same voltage regulator we used in class except	• Have to be careful with current, it will overheat easily if

Option 1:  NCV2575D2T-5R4G Link to Product	it is surface mount. • Output is 3.3V but it is adjustable. • Datasheet is very helpful. • It is very efficient.	over load current. • Turns off if input voltage is more than 1.4V
Option 2:  AP61100Z6-7 Link to Product	• Has a very helpful datasheet • 1A load current • 89% efficiency.	• Output voltage only from 0.6V-3.6V (very constraining)
Option3:  MP2172CGQFU-Z Link to product		

Choice:NCV2575D2T-5R4G

Rationale: When deciding on our components, we wanted to try and use as many components from class as possible. Not only is the component we used in class much more convenient to use, we believe it is the best option that we could find.