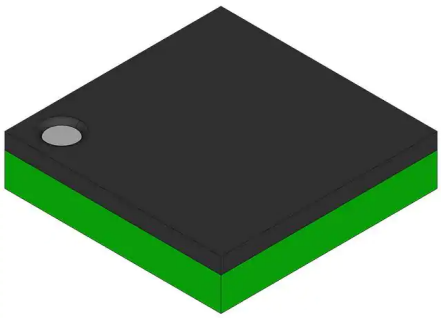
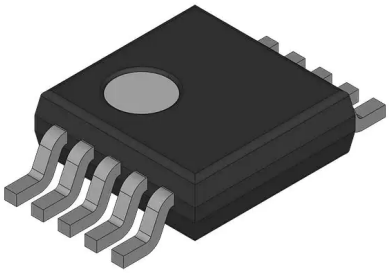
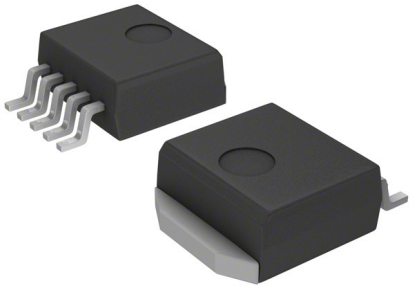
Table 1:**Voltage Regulator**

Solution	Pros	Cons
 Option 1. FAN48630BUC33X $0.52 Each Link to Product	• 1A safety output • High Efficiency • 3.3V fixed output • Affordable	• Limit Temperature tolerant range
 Option 2. ISL6410AIUZ-TK $1.86/each Link to product	• 1A safety output • Thermal Shutdown • Stable with Small Ceramic Output Capacitors	• Low efficiency • Can't Stand High Temperature • Unaffordable

 Option 3. LM2576D2Tr4-3.3G $2.81/each Link to product	• Surface amount • High temperature tolerance • Satisfies voltage Output requirements	• Can only be ordered in packs of 50 • Output current and voltage fluctuations $\pm$ $1V$

Choice: Option 3

Rationale: Because the Third one has the lowest price and the highest availability. At the same time, it meets the requirements of our project, safe to use, can withstand severe temperature changes, stable 3.3V output and 1A safe current output.It's surface amount.

Table 2:**Power Source**

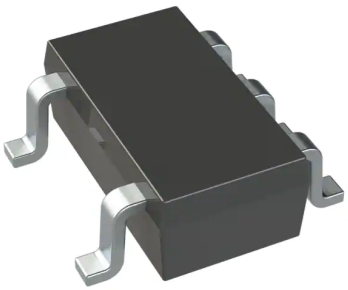
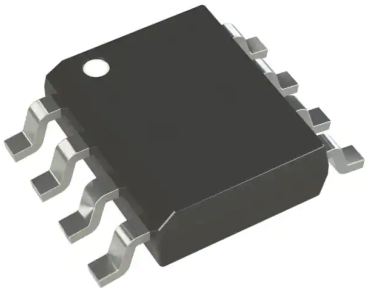
Solution	**Pros**	**Cons**
 Option 1. VER12US120-JA $14.74 Each	• Continuous source of 12V • No need to replace components over time • Outputs up to 3 Amps	• Requires a direct connection • Wired connection can be tedious to manage • Limits portability of design

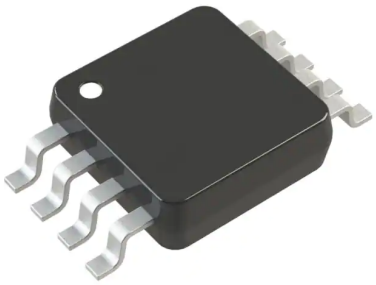
Link to Product		
 Option 2. A23C $0.9/each Link to product	• Affordable • Can withstand high temperatures • Many in stock (digikey)	• Unstable • Output voltage dips from 9V to 5V after a day of use (Constant Output)
 Option 3. 23A(LR23) $0.42/each Link to product	• Affordable • Highest max power	• Few in stock • Highest minimum current and voltage requirements

Choice: Option 1

Rationale: The team opted to use the AC/DC 12V power supply due to its ease of use and consistent 12V supply. The loss of portability is made up for by the convenience of not needing to replace batteries after repeated usage.

Table 3: **Temperature sensor**

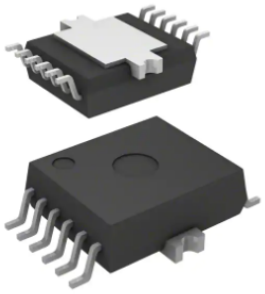
Solution	**Pros**	**Cons**
 Option 1: TC74A4-3.3VCTTR $1.09 each link	• Inexpesive • Meets the surface mount requirement • I2C	• Heats up when applied with max ratings
 Option 2: MCP9808T-M/SN $1.44 each Link	• I2C • Meets surface mount Requirements	• Lower Voltage

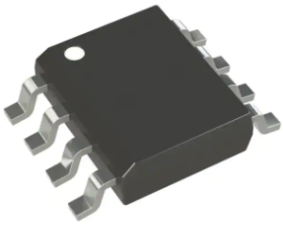
 Option 3: ADT75BRMZ $3.76 each Link	• I2C • Meets surface mount Requirements	• Very Expensive

Choice: **Option 1**

Rationale: My reason for selecting option 1 is that it is easier to use because we will be using it in class. It is also the cheapest option out of the three options. It also meets the I2C and surface mount requirements.

Table 4: **Motor sensor**

Solution	**Pros**	**Cons**
 Option 1: IFX9201SGAUMA1 $4.88 each Link	• Meets the surface mount requirement	• Heats up when applied with max ratings • Very Expensive

 Option 2: 846-BD6981FVM-GTRDKR-ND $0.92 each Link	• Meets surface mount Requirements • Inexpesive	• Lower Voltage
 Option 3: TC647BEOA-ND $1.63 each Link	• Meets surface mount Requirements • Inexpesive	• Lower Voltage

Choice: **Option 1**

Rationale: Option 1 is the better suite compare to other two, due to its efficiency even when the cost is high

Table 5: Motor

Solution	**Pros**	**Cons**
	• Inexpesive • Meets the surface mount requirement	• Heats up when applied with max ratings

Option 1: HC385G-302 $6.72 each link		
 Option 2: 1597-114090046-ND $5.20 each Link	• Meets surface mount Requirements • Inexpesive	• Lower Voltage • Datasheet is not clear
 Option 3: 2790-NF143G-301-ND $9.07 each Link	• Meets surface mount Requirements	• Very Expensive • Datasheet is not clear

Choice: **Option 1**

Rationale: Option 1is the best suite, as it's price is reasonable and is easy to soldier and has high efficency.