

# **Senior Design 2018/2019**

Notorious EMG

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Mitigation Analysis

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1. **Lithium Ion Battery Failure** – A battery failure could be catastrophic, not just to the components, but to the users themselves, as the sleeve could potentially catch fire and cause up to third degree burns to the users. As a result, we have designed the unit to be quickly detachable from the sleeve, by way of the three snaps that are also used as signal inputs. This way should something happen, rather than being forced to pull the entire unit off, which is not only slow, but could also potentially cause more harm to the user, they may remove the failed box and then pull the sleeve off. This does still pose a risk to the user, but the damage done to them is mitigated.
2. **Short Circuiting** – A short in the unit could result in either total unit failure or deliverance of a shock to the user. To prevent this, we may use some type of sealant on the boxes themselves to ensure that nothing unwanted may get in or out.
3. **Cost of PCB manufacturing exceeds budget** – If the cost of the PCB manufacturing were to exceed our budget for the Muscle Guide, it would hinder our success if we were to commercial it. As it stands, the PCB with the SCU is approximately 4.9" x 3.5" with a base price of \$33 per board. With the manufacturing we are buying the PCB from, a single board can be up to 60" x 60". Therefore, with only 4.9" x 3.5" per SCU unit, it can be designed to have 12 SCU units on a single PCB order, cutting the cost of a single SCU PCB from \$33 per unit to \$2.75 per unit. By designing multiple SCUs on a single PCB order, we can reduce the PCB manufacturing cost by 92% per unit.