**16681: MRSD Project 1 / Task PDB**

Team: **H**

Team Members:

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**Section 3: Analysis**

**Q1. State the efficiency of each of your regulators**

* Formula for Efficiency: **[1 – ((Vin - Vout)/(Vin))] x 100%**
* Maximum Operating Input Voltage for MIC29300-XXWU as per datasheet: **26V**

|  |  |  |  |
| --- | --- | --- | --- |
| **Part** | **Vin** | **Vout** | **Efficiency** |
| MIC29300-3.3WU | 24V | 3.3V | 13.75% |
| MIC29300-5.0WU | 24V | 5V | 20.83% |
| MIC29300-12WU | 24V | 12V | 50% |

**Q2. State the input power used of each subsystem at maximum rated output**

* Formula for Power **P**: **V x I**
* Values of voltage/current is as per diagram given in Step1 of PDB document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Subsystem** | **Input Voltage** | **Current** | **Power** |
| CPU | 24V | 1A | 24W |
| WiFI+Encoder | 24V | 1A | 24W |
| LIDAR | 24V | 2A | 48W |
| Motor | 24V | 10A | 240W |
| **Total** |  | | **336W** |

**Q3. State the total system efficiency at maximum rated output**

* Formula for Power **P**: **V x I**

|  |  |  |  |
| --- | --- | --- | --- |
| **Subsystem** | **Voltage** | **Current** | **Power** |
| CPU | 3.3V | 1A | 3.3W |
| WiFI+Encoder | 5V | 1A | 5W |
| LIDAR | 12V | 2A | 24W |
| Motor | 24V | 10A | 240W |
| **Total** |  | | **272.3W** |

* Efficiency **= Output/Input x 100**

= 272.3/336 x100% = **81.04%**