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%**