Thermal Testing: Bdot Board MSP430 Magnetometer

**Introduction/Procedure**

The goal of this test is to verify that with extreme temperature change, CAN packets are still sending and working properly, see if magnetometer readings (both dipole values and temperature readings) are valid, and to verify that the i2C bus from the magnetometer to the MSP is still functioning. Data were sent through CAN and checked using CANKing on the monitor.

Contents of CAN packets:

1. X magnetic field values

2. Y magnetic field values

3. Z magnetic field values

4. MSP temperature reading

5. Magnetometer temperature reading

The HMC 5883 Magnetometer was configured to be temperature compensated so ideally there shouldn’t be a significant change in the magnetic field readings.

**Thu made a software mistake and wasn’t able to report if the magnetic field values were negative or positive values.**

**Result**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Baseline (23.7C)** | **Extreme Low (-20C)** | **Extreme High (71C)** |
| **MSP temperature** | 23 | -21 | 71 |
| **Magnetometer temperature** | 28 | -13 | 74 |
| **Magnitude X (nanoTesla)** | 19498 | 19272 | 19856 |
| **Magnitude Y (nanoTesla)** | 24893 | 25623 | 24090 |
| **Magnitude Z (nanoTesla)** | 18104 | 19710 | 17082 |