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**Test Report Number: 123456 Issue 1**

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**Customer Name & Address:** Company Name Ltd  
Industrial Estate  
Cambridge  
WY1 2YZ

**Customer Order Number:** PO987654-1

**Test Item(s) Description:** Electronic Control Unit

**Author:**

**Approval:**

**Issue Date:**

*The results detailed herein relate only to the test item(s) submitted for testing.  
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.*

**Test Report Number: 123456 Issue 1**

## Contents

|          |  |          |
|----------|--|----------|
| <b>1</b> | <b>Introduction</b> .....              | <b>3</b> |
| <b>2</b> | <b>Equipment List</b> .....            | <b>3</b> |
| <b>3</b> | <b>Test Item Serial Numbers</b> .....  | <b>3</b> |
| <b>4</b> | <b>Test Plan</b> .....                 | <b>4</b> |
|          | 4.1 Thermal Shock .....                | 4        |
|          | 4.2 Random Vibration .....             | 4        |
| <b>5</b> | <b>Test Results</b> .....              | <b>5</b> |
|          | 5.1 Thermal Shock .....                | 5        |
|          | 5.2 Random Vibration .....             | 6        |
|          | 5.3 Test Item Mounting .....           | 7        |
| <b>6</b> | <b>Conclusions</b> .....               | <b>9</b> |
| <b>7</b> | <b>Document Revision History</b> ..... | <b>9</b> |

## Tables & Figures

|   |   |
|---|---|
| Table 1: Equipment List .....   | 3 |
| Table 2: Test Item Serial Numbers .....                                       | 3 |
| Table 3: Thermal Shock .....  | 4 |
| Table 4: Random Vibration .....   | 4 |
| Table 5: Revision History .....   | 9 |
| Figure 1: Thermal Shock Profile .....   | 5 |
| Figure 2: Vibration Profile .....   | 6 |
| Figure 3: Test Item Mounting: Thermal Shock and Random Vibration Z Axis ..... | 7 |
| Figure 4: Test Item Mounting: Random Vibration X & Y Axes .....               | 8 |

**Test Report Number: 123456 Issue 1**

## 1 Introduction

This report details the environmental testing carried out on two Electronic Control Units, as supplied by Company Name Ltd.

The test items were subjected to the environmental tests detailed in Section 4 of this report, following the guidelines of the defined environmental test standards.

The testing was performed between 1<sup>st</sup> and 7<sup>th</sup> August 2018.

## 2 Equipment List

| Description:                      | Serial No:   | Calibration Due:               |
|-----------------------------------|--------------|--------------------------------|
| VT 7012 S2 Thermal Shock Chamber  | 524/79175    | 1 <sup>st</sup> May 2019       |
| G&W V2644 Shaker                  | 03_A6Q_17443 | 20 <sup>th</sup> March 2019    |
| G&W D5A4-24K Amplifier            | 03_A6Q_17444 | n/a                            |
| Data Physics Vibration Controller | 5148         | 15 <sup>th</sup> February 2019 |
| 352B10 Accelerometer              | 44487        | 17 <sup>th</sup> April 2019    |

Table 1: Equipment List

## 3 Test Item Serial Numbers

| Description:            | Part Nos: | Serial Nos: |
|-------------------------|-----------|-------------|
| Electronic Control Unit | ABC123    | Test001     |
| Electronic Control Unit | ABC123    | Test002     |

Table 2: Test Item Serial Numbers

**Test Report Number: 123456 Issue 1**

## 4 Test Plan

Table 3 and Table 4 define the environmental test profiles to which the test items were subjected.

### 4.1 Thermal Shock

|                            |  |
|----------------------------|--|
| <b>Reference Standard:</b> | BS EN 60068-2-14: 2009: Test Na: Change of Temperature |
| <b>Severities:</b>         | -40°C to +120°C  |
| <b>Dwell Times:</b>        | 60 minutes   |
| <b>Transition Time:</b>    | < 10 seconds   |
| <b>Duration:</b>           | 50 cycles  |

Table 3: Thermal Shock

### 4.2 Random Vibration

|   |  |
|---|--|
| <b>Reference Standard:</b>              | RTCA DO-160E: Section 8.7.2                          |
| <b>Profile:</b>                         | Robust Vibration Test Procedure: Fixed Wing Aircraft |
| <b>Severities:</b>                      | Profile E1   |
|   | 10Hz            0.040g <sup>2</sup> /Hz              |
|   | 28Hz            0.040g <sup>2</sup> /Hz              |
|   | 40Hz            0.080g <sup>2</sup> /Hz              |
|   | 100Hz           0.080g <sup>2</sup> /Hz              |
|   | 200Hz           0.160g <sup>2</sup> /Hz              |
|   | 500Hz           0.160g <sup>2</sup> /Hz              |
| 2000Hz          0.011g <sup>2</sup> /Hz |  |
| <b>Duration:</b>                        | 3 hours in each of three mutually perpendicular axes |

Table 4: Random Vibration

**Test Report Number: 123456 Issue 1**

## 5 Test Results

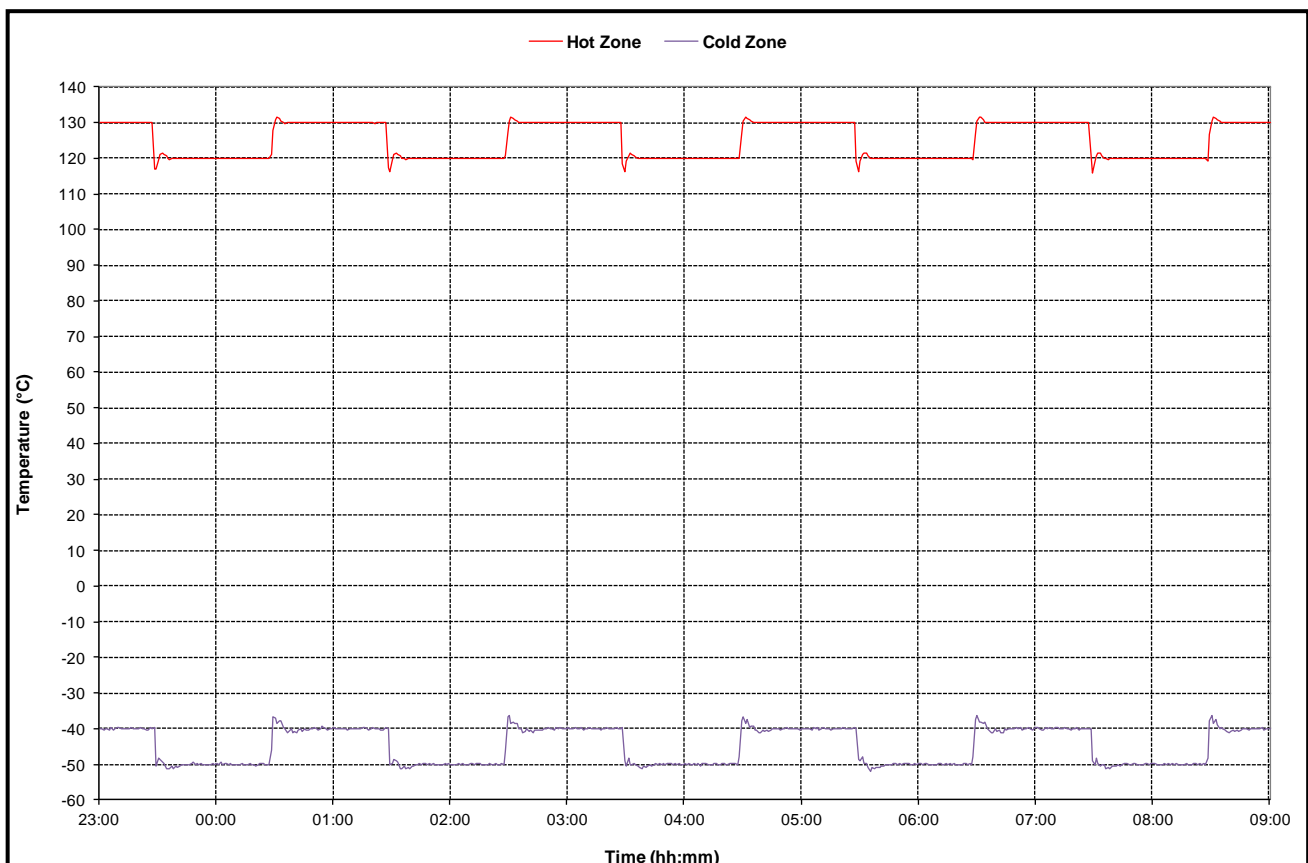
### 5.1 Thermal Shock

Figure 1 presents the results of the Thermal Shock test.

The test items were subjected to a total of 50 cycles of the defined test profile, but for clarity, only 5 cycle are shown.

The chamber enables the work zones to be pre-conditioned at a level above/below the defined Hot/Cold severities to reduce the effects of the test item cage thermal inertia as it enters the work zone. In this instance, the pre-conditioning levels were  $\pm 10^{\circ}\text{C}$ .

Functional verification testing was the responsibility of the customer, the results of which do not form part of this test report.



**Figure 1: Thermal Shock Profile**

**Test Report Number: 123456 Issue 1**

## 5.2 Random Vibration

Figure 2 presents the results of the Random Vibration test.

The test items were subjected to the defined test profile for 3 hours in each of three mutually perpendicular axes.

Functional verification testing was the responsibility of the customer, the results of which do not form part of this test report.

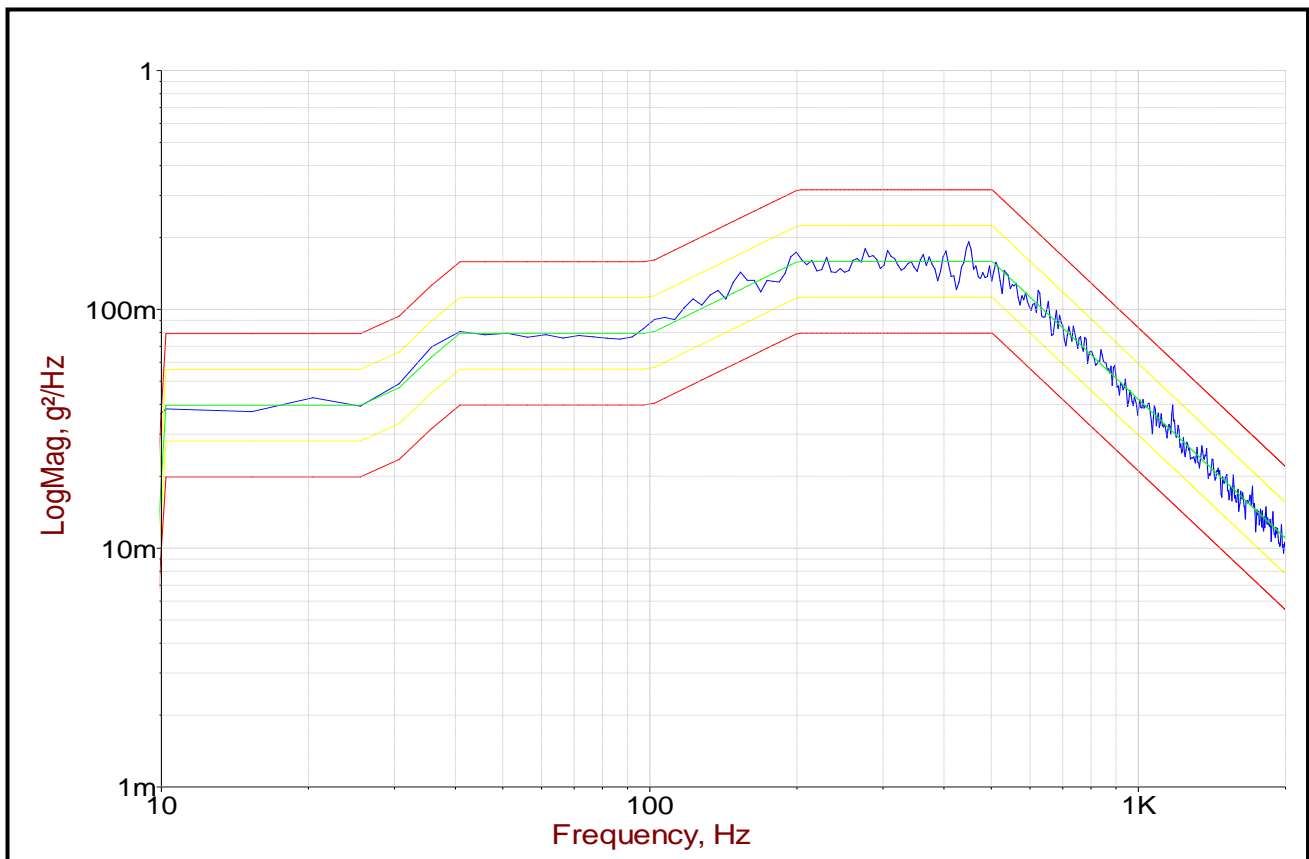


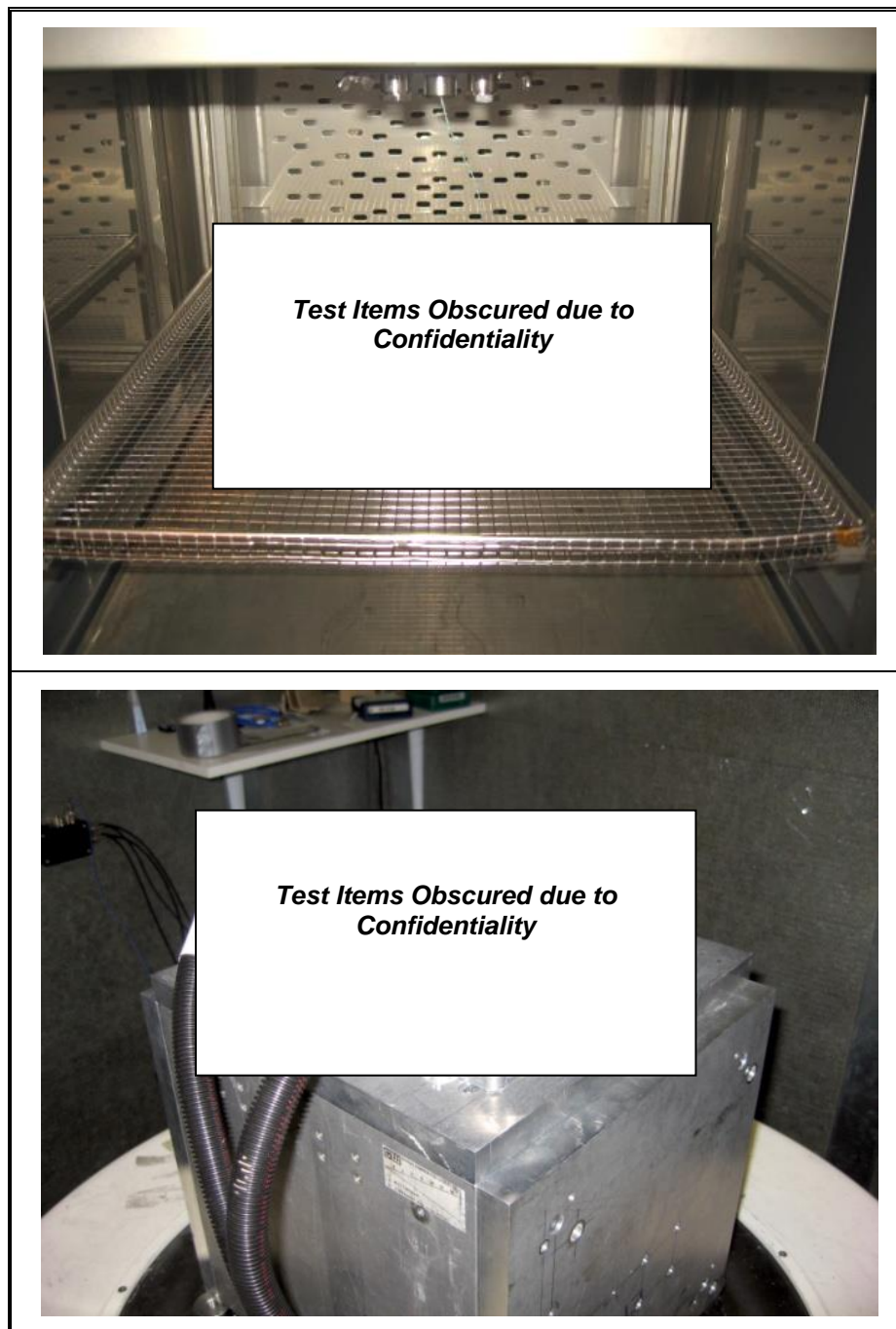
Figure 2: Vibration Profile

**Test Report Number: 123456 Issue 1**

### 5.3 Test Item Mounting

Figure 3 and Figure 4 depict the mounting of the test items during the applied tests.

The test items were positioned on a chamber shelf for the Thermal Shock test and mounted via their in-service mounting holes for the Random Vibration test.



**Figure 3: Test Item Mounting: Thermal Shock and Random Vibration Z Axis**

**Test Report Number: 123456 Issue 1**



**Figure 4: Test Item Mounting: Random Vibration X & Y Axes**



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**Test Report Number: 123456 Issue 1**

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## 6 Conclusions

The detailed tests were performed in accordance with the requirements of the defined environmental test standards.

Functional verification testing was the responsibility of the customer, the results of which do not form part of this test report.

## 7 Document Revision History

| Revision Level | Summary of Changes |
|----------------|--------------------|
| 1              | Initial Release    |

Table 5: Revision History

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END OF REPORT