

# VIBRATION TESTING OF PCBA

ENSURING RELIABILITY IN ELECTRONICS THROUGH VIBRATION  
TESTING

## Introduction

Vibration is a major factor that can cause failure in the electronics industry. Ensuring the reliability of Printed Circuit Board Assemblies (PCBAs) is critical, particularly in applications where devices are exposed to mechanical stress during transportation and operation.

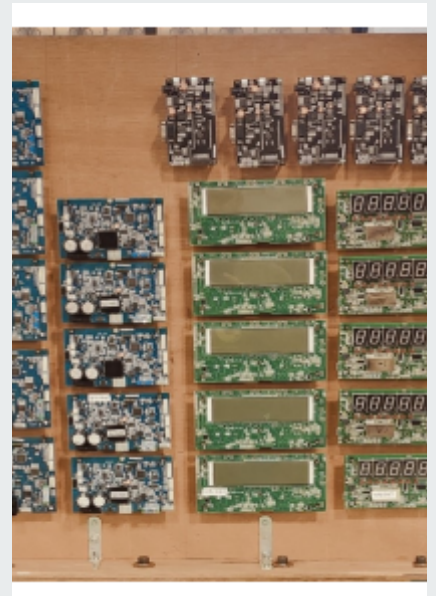
At Mitatronics, we conduct PCB vibration testing to evaluate the durability and performance of electronic components under real-world conditions. Our testing services help industries such as automotive, aerospace, industrial electronics, and transportation improve product longevity and reliability.

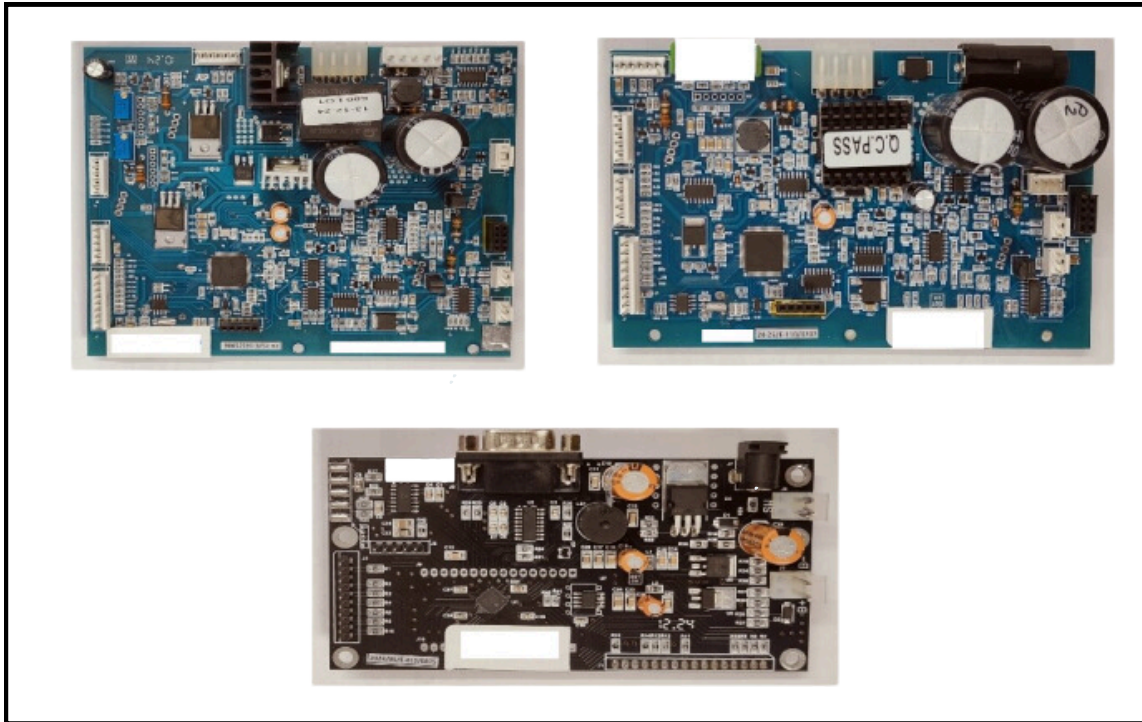
## Why is Vibration Testing Important?

Vibration testing helps detect and mitigate potential failure points in PCBAs, including:

- **Component Reliability:** Identifying weaknesses in solder joints, capacitors, resistors, and semiconductors.
- **Connection Integrity:** Preventing intermittent or complete failures in solder joints and interconnections.
- **Performance Impact:** Detecting shifts in electrical characteristics that can affect functionality.
- **Harmonics & Resonance:** Preventing amplified stresses that can cause structural failures.

- **Design Optimization:** Helping designers refine layouts, placements, and attachment methods for increased resilience





## Applicable Standards

We adhere to internationally recognized standards to ensure compliance and accuracy:

- MIL-STD-202 - Environmental test methods for electronic components.
- IEC 60068-2-6 - Standard for vibration testing.
- ASTM D3580 - Guidelines for vibration testing of electronic equipment.

## Test Parameters

Our vibration testing process includes:

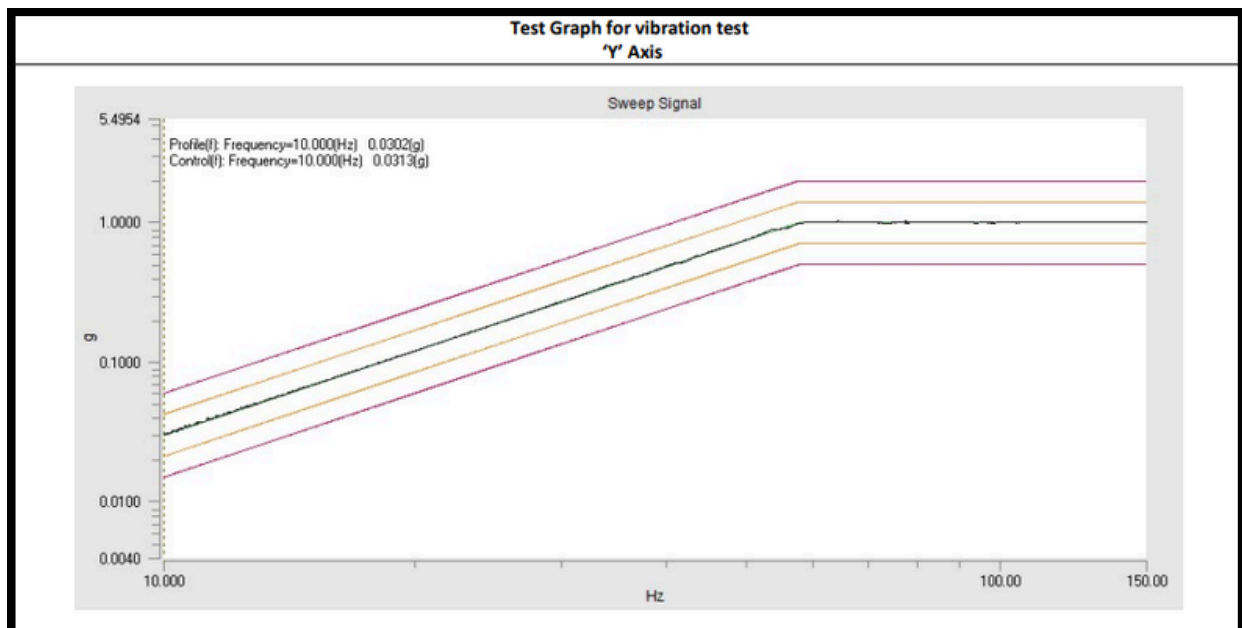
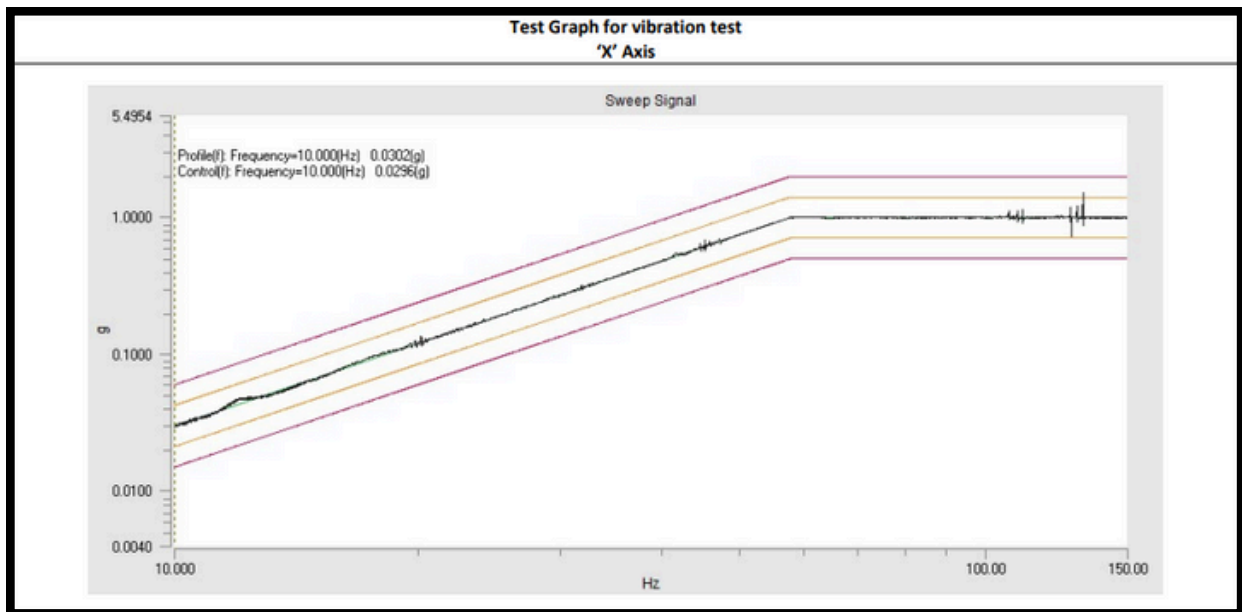
- Frequency: 10 Hz to 55 Hz
- Displacement:  $\pm 0.15$  mm peak
- Sweep Rate: 1 Oct/min
- Test Duration: 12 sweeps per axis
- Axes Tested: X, Y, and Z

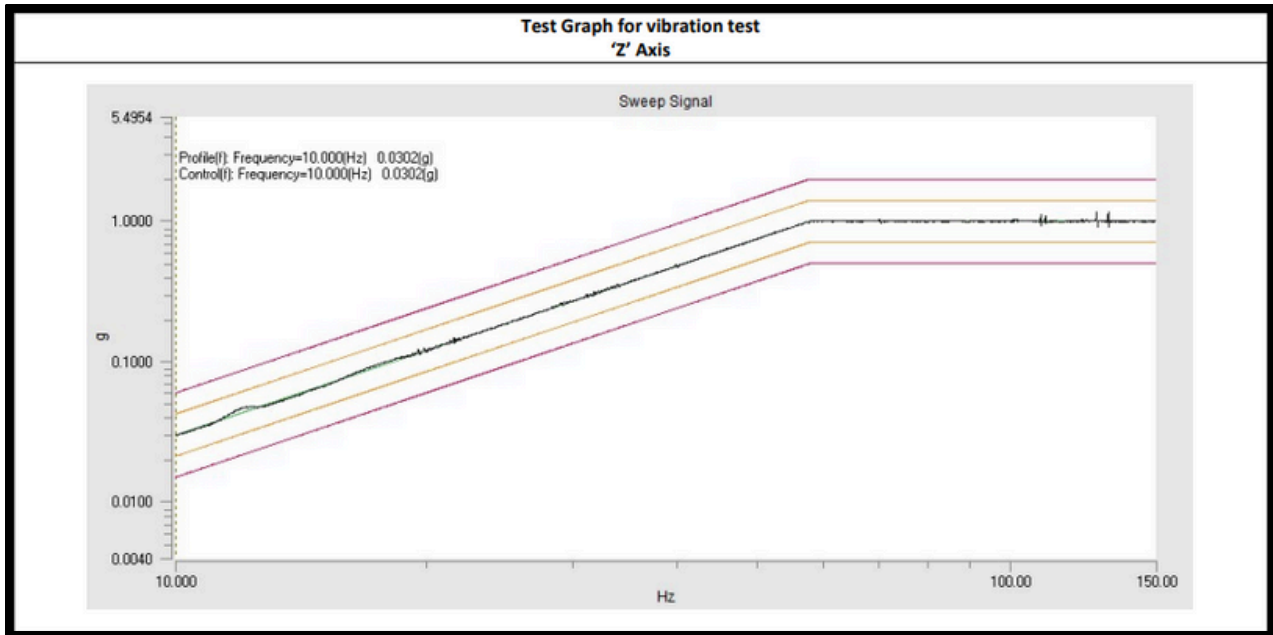
## Test Procedure

1. Pre-Test Inspection: Visual inspection for mechanical damage before testing.
2. Mounting & Configuration: The PCBA is mounted on a vibration table with an accelerometer.
3. Testing Execution: The board undergoes controlled vibrations in three axes.
4. Post-Test Inspection: A second visual check ensures no mechanical damage has occurred.
5. Compliance Evaluation: Results are assessed against IEC **60068-2-6 standards.**

# OBSERVATIONS & RESULTS

- Pre-Test Condition: No visible mechanical damage.
- Post-Test Condition: No visible mechanical damage observed.
- Final Conclusion: The Equipment Under Test (EUT) met IEC 60068-2-6 requirements, confirming its vibration resistance.

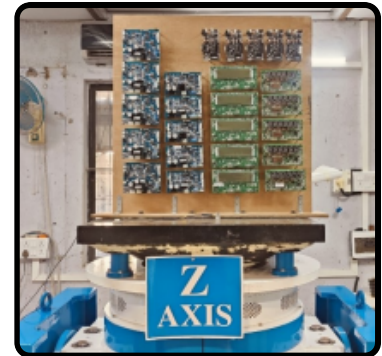




**X AXIS**



**Y AXIS**



**Z AXIS**

## Conclusion

Vibration testing is crucial for ensuring the durability of electronic devices. At Mitatronics, we offer rigorous testing solutions to help manufacturers detect potential issues early, optimize designs, and enhance product reliability.

For further validation, we also recommend thermal cycling and mechanical shock testing to assess performance under extreme conditions.

Explore our testing services to enhance the durability of your products!