

# GOOGLE'S OPEN SOURCE RANDOM VIBRATION TESTING OF FULLY POPULATED RACKS WITH OFF-THE-SHELF DATA CENTER HARDWARE

## TABLE OF CONTENT AND SCHEDULE OF FUTURE RELEASE

### REVISION A

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Papers/sample data/diagrams/photos/videos have been uploaded under specific tracks in the “[White Papers](#)” section. The material is organized in the following ways:

Track 1. [A High Level Overview of Google's Random Vibration Testing Methodology](#) (In Progress)

- 1.1 [Sine Vibration of A Machine](#)
- 1.2 [Sine Vibration of A Machine Inside A Rack](#)
- 1.3 [Random Vibration's Impact on Machine and PCB](#)
- 1.4 Component Level Measurement and Analysis (Planned)
- 1.5 Correlation of Additional Measurement Methods with Shock and Vibration (Planned)
- 1.6 Comparing Sine/Random Vibration/Shock Conditions (Planned)
- 1.7 Fatigue and Factor of Safety Calculation

Track 2. [Environmental Conditions](#) (In Progress)

- 2.1 [An Examination of Random Vibration from Google's Supply Chain](#)
- 2.2 Extracting More Information From Field Data (Planned)

Track 3. Rack Level Analysis (Planned)

Track 4. Machine Level Analysis (Planned)

- 4.1 Comparing Natural Frequencies and Mode Shapes of Different Machine Form Factors (Planned)

Track 5. Component Level Analysis (Planned)

- 5.1 Pressure Measurement of ASIC/Heatsink During Shock and Vibration (Planned)
- 5.2 Strain Measurement during Shock and Vibration (Planned)
- 5.3 Microscopic Displacement Measurement of Microelectronics (Planned)

Moving forward, we will release new materials on a biweekly basis following a regular release schedule. If you have questions or requests for specific topics, please e-mail [openrandomvibe@ocproject.net](mailto:openrandomvibe@ocproject.net) directly and I will be happy to add them to the schedule. Feedback is always welcomed on how to make this project better and more useful to you, the readers.

Bi-Weekly White Paper Regular Release Schedule:

April 7th:	1.4 Component Level Measurement and Analysis
April 21st:	1.5 Correlation of Additional Measurement Methods with Shock and Vibration
May 5th:	5.1 Pressure Measurement of ASIC/Heatsink During Shock and Vibration
May 19th:	5.2 Strain Measurement during Shock and Vibration
May 26th:	5.3 Microscopic Displacement Measurement of Microelectronics
June 2nd:	2.2 Extracting More Information From Field Data
June 9th:	4.1 Comparing Natural Frequencies and Mode Shapes of Different Machine Form Factors
June 16th:	1.6 Comparing Sine/Random Vibration/Shock Conditions
June 23rd:	1.7 Fatigue and Factor of Safety Calculation