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Test Report Summary

HT02602

Environmental Testing of SMT Shield Clips
S1411, S1711 and S1721

1. Introduction

1.1. Description and Purpose

The purpose of this test program is to confirm the vibration, shock and bump performance of SMT Shield Clips; S1411-46R, S1711-46R and S1721-46R. Four shield clips were used per shield can, of the following dimensions.

Shield Clip	S1411-46R	S1711-46R	S1721-46R
Can Material Thickness	0.85mm	0.30mm	0.18mm
External Dimensions	(W)20.85 x (L)25.85 x (D)4.15mm	(W)20.30 x (L)25.30 x (D)4.15mm	(W)20.18 x (L)25.18 x (D)4.15mm

1.2. Conclusion

The following data has been collated from Harwin test report ET3858.

1.2.1. S1411-46R

Under the specified conditions, the vibration, shock and bump requirements were met. The shield can remained clipped to the board throughout all tests carried out. It is possible that this clip is suitable for use in environments where harsh vibration, shock and bump requirements would be experienced (although Harwin recommend independent testing is carried out as each application can vary).

1.2.2. S1711-46R and S1721-46R

The samples were subjected to the Z axis vibrations tests, and failed at the 20g test (section 2.3b). The samples were subsequently not used in any other tests. Under the specified conditions, the vibration, shock and bump requirements were not met. The shield cans came away from the board during the tests carried out.

It is not recommended that these clips are suitable for use in environments where harsh vibration, shock and bump requirements would be experienced. It may be possible that these clips are suitable for use in environments where lower vibration, shock and bump requirements would be experienced, and Harwin recommend independent testing is carried out as each application can vary.

2. Test Method, Requirements and Results

2.1. Specification Parameters

The testing performed included:

- Swept Sine (Vibration): generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc.
- Shock: generally in accordance with BS 9525 and BS EN 60068-2-27 test Ea.
- Bump: generally in accordance with BS 9525 and BS EN 60068-2-27 test Ea.

2.2. List of Test Samples

- S1411-46R – SMT Shield Clip: 0.7-1.0mm shield cans (all tests)
- S1711-46R – SMT Shield Clip: 0.3mm shield cans (Z-axis 10/20g Vibration only)
- S1721-46R – SMT Shield Clip: 0.13-0.23mm cans (Z-axis 10/20g Vibration only)

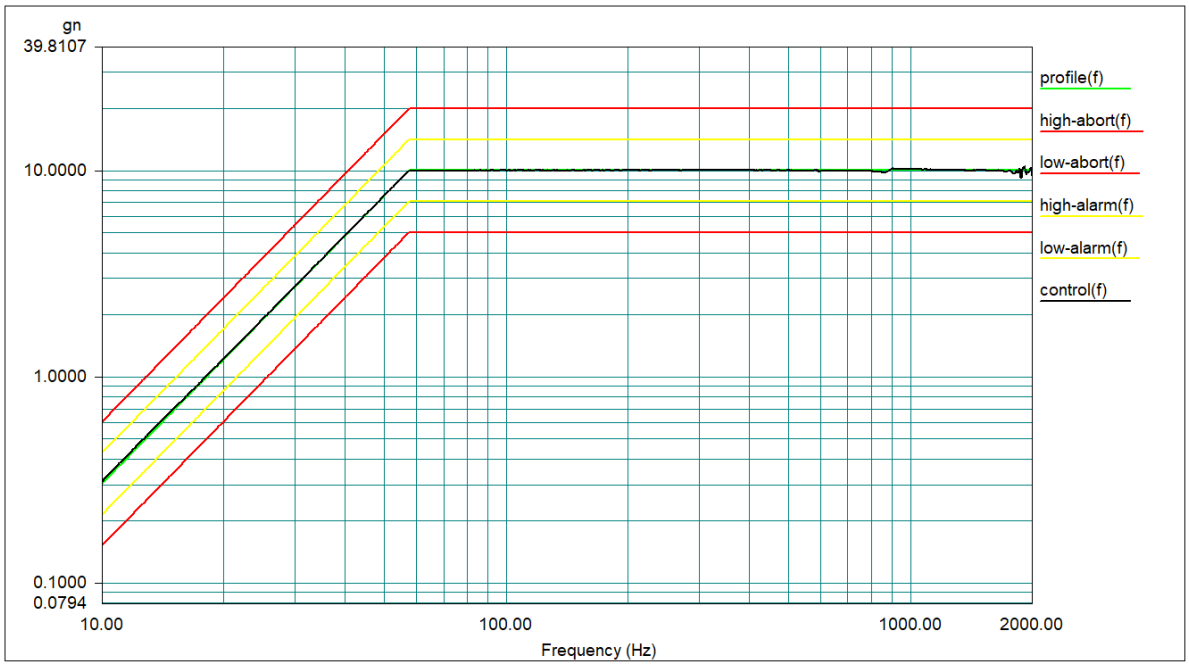
2.3. Test Method and Results

2.3.1. Vibration – 10g

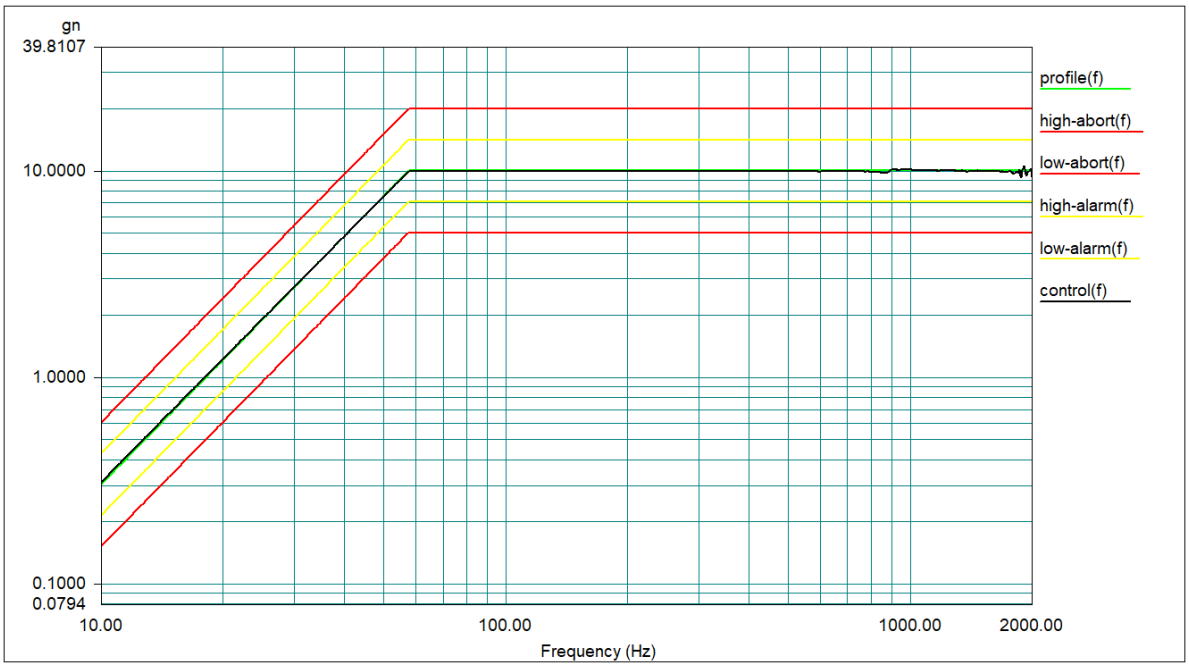
Methodology: The sample was subjected to a Swept Sine Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc, under the following conditions:

- 10-57.55Hz @ 1.5mm peak-peak, 57.55-2,000Hz @ 10g
- Sweep rate 1 octave/minute for 30 minutes in each axis
- Intermittencies on each connector to be recorded

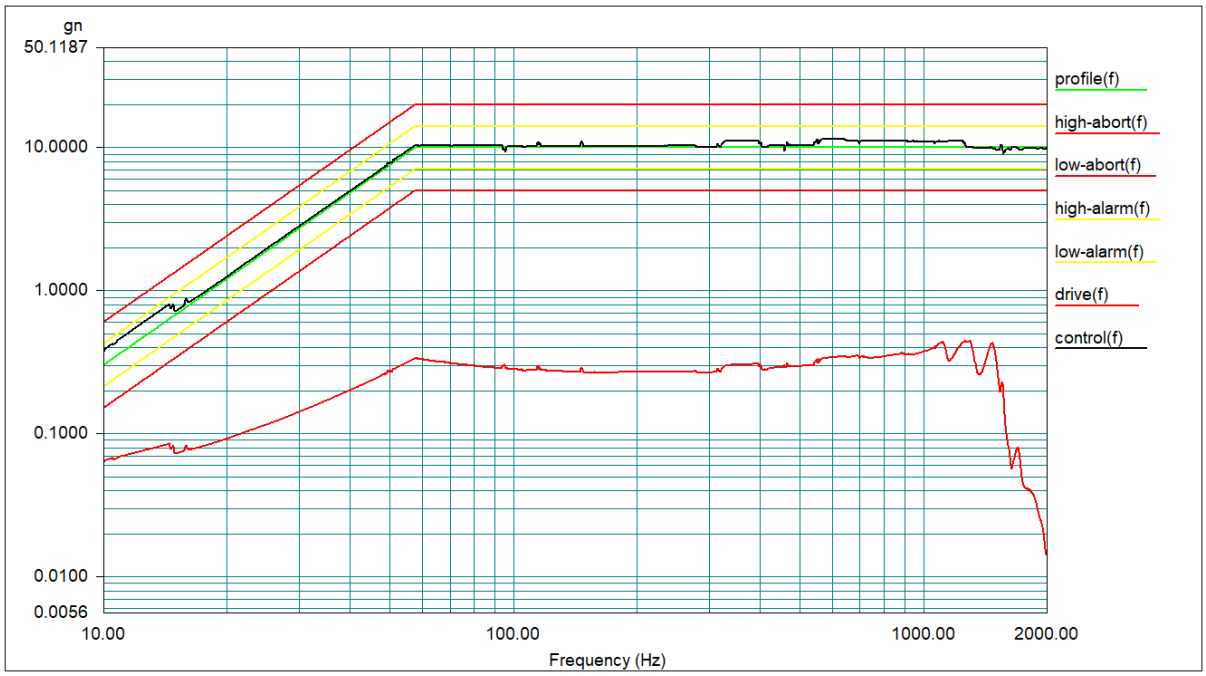
Results: In each plot, the black line is the Control Accelerometer response. The red line in the Z axis plot is the Shaker Drive response.



X axis - 10g Sine Vibration Plot



Y axis - 10g Sine Vibration Plot



Z axis - 10g Sine Vibration Plot

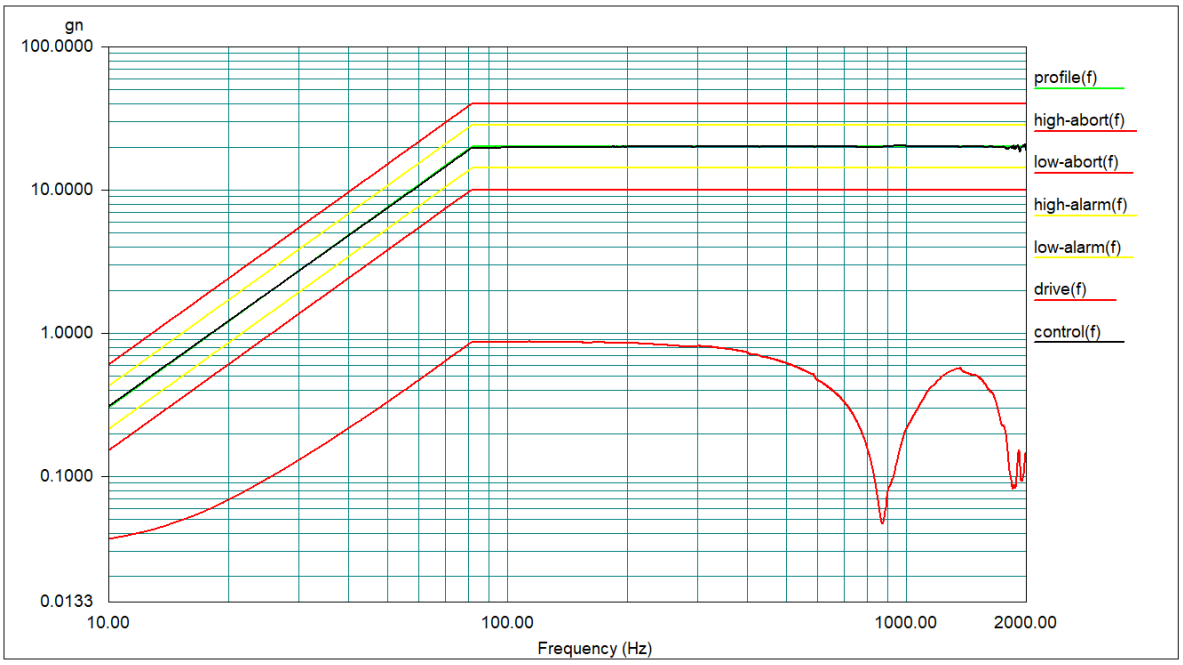
2.3.2. Vibration – 20g

Methodology: The sample was subjected to a Swept Sine Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Fc, under the following conditions:

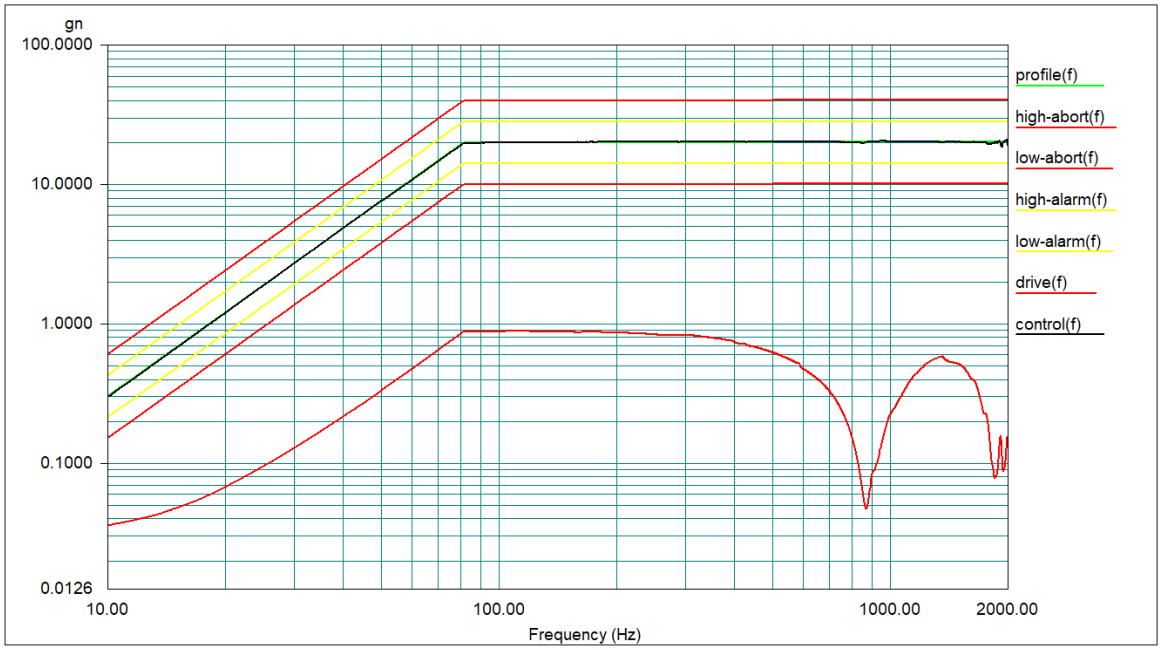
- 10-81.73Hz @ 1.5mm peak-peak, 57.55-2,000Hz @ 20g
- Sweep rate 1 octave/minute for 30 minutes, followed by 2 hours in each axis if no intermittencies are recorded during the 30 minute duration
- Intermittencies on each connector to be recorded

Results: During the first 30 minute vibration sweep (Z-axis), the shield cans held by both S1711-46R and S1721-46R had detached from the circuit board. The can held by S1411-46R was further subjected to the other axis tests, the 120 minute test and all subsequent tests.

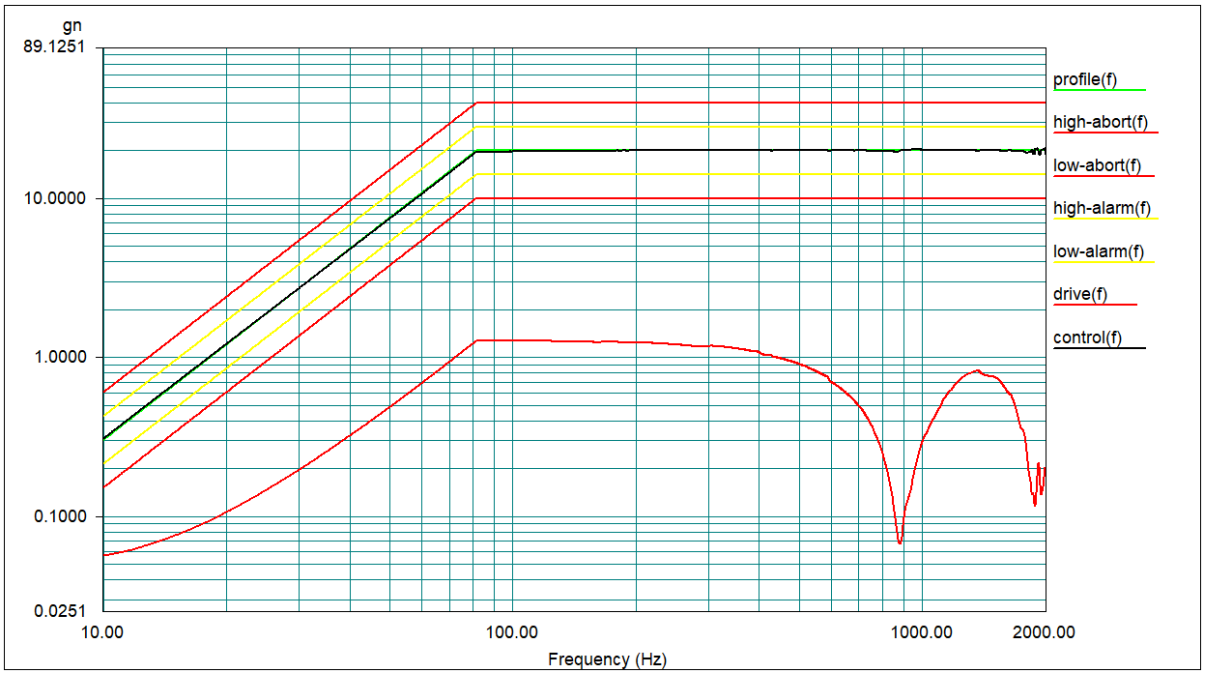
In each plot, the black line is the Control Accelerometer response, and the red line is the Shaker Drive response.



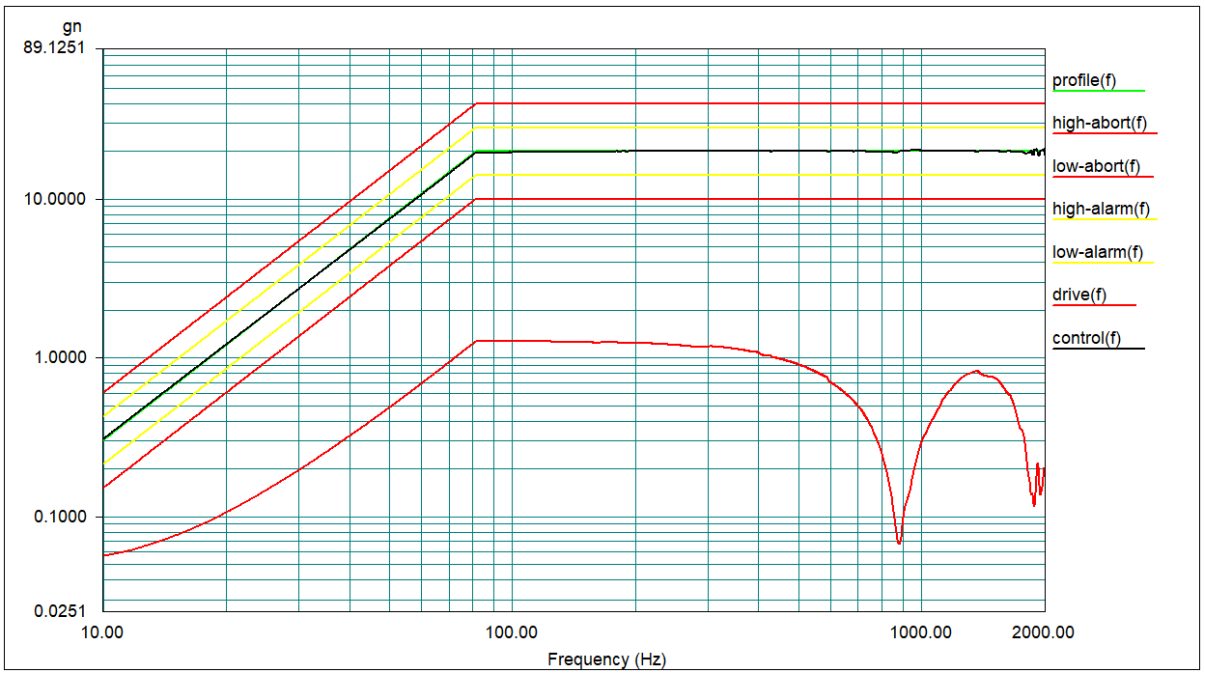
X axis - 20g Sine Vibration Plot for 30 minutes



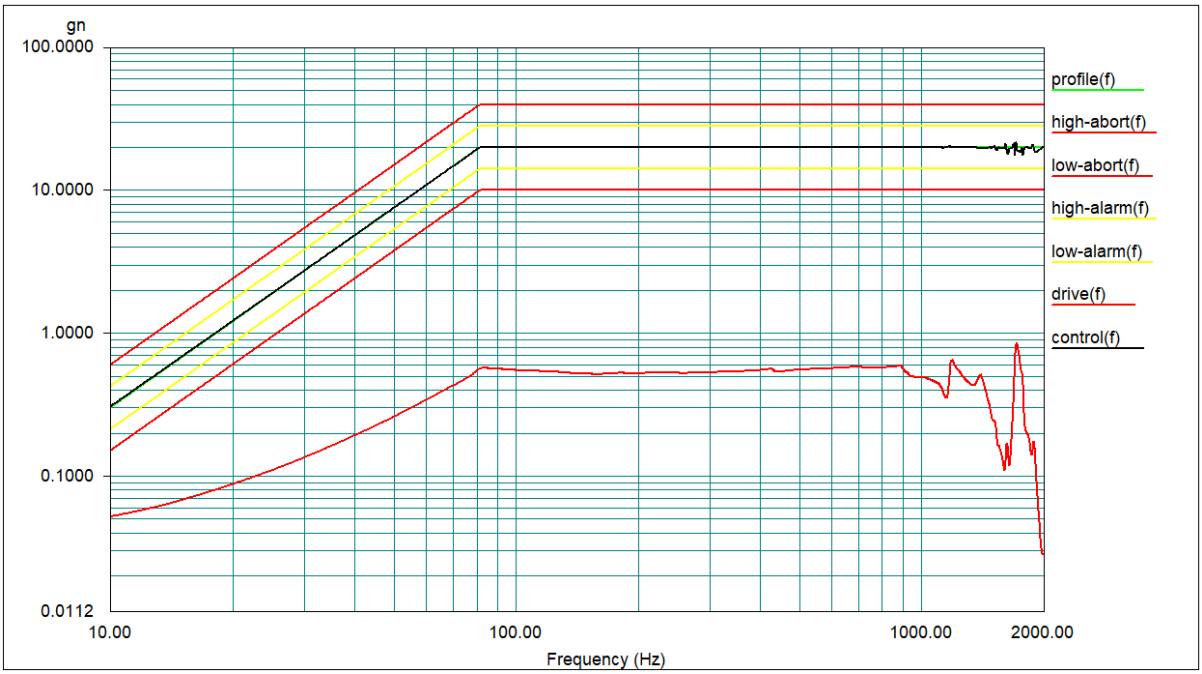
X axis - 20g Sine Vibration Plot for 120 minutes



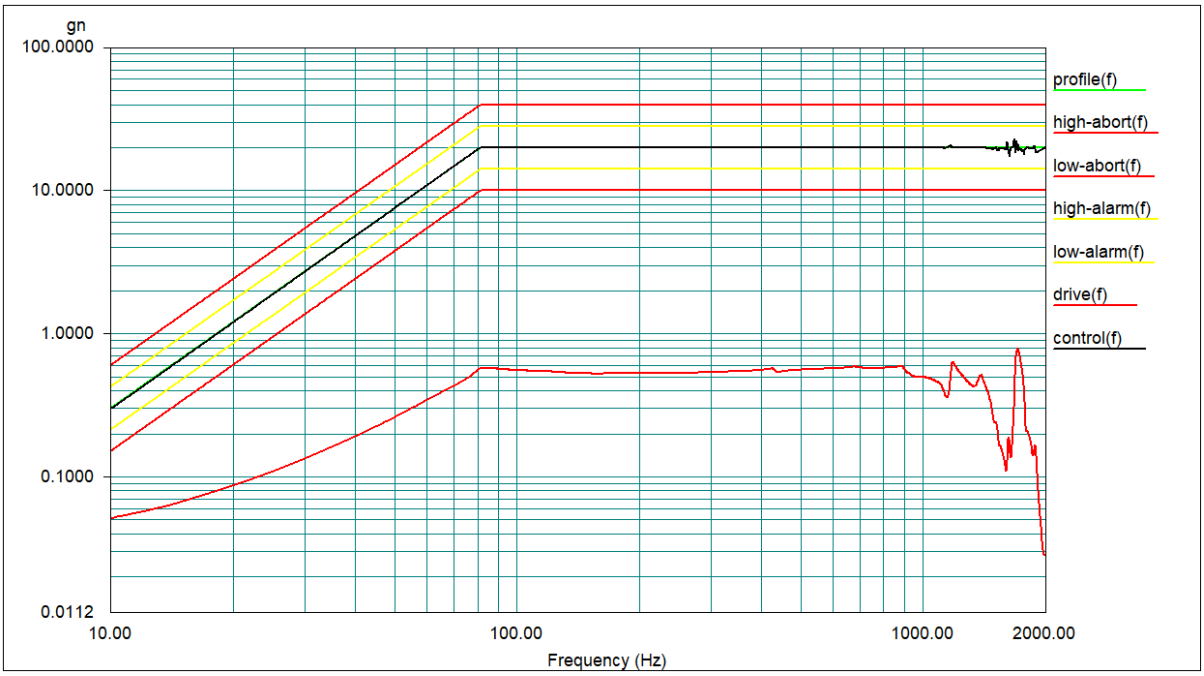
Y axis - 20g Sine Vibration Plot for 30 minutes



Y axis - 20g Sine Vibration Plot for 120 minutes



Z axis - 20g Sine Vibration Plot for 30 minutes



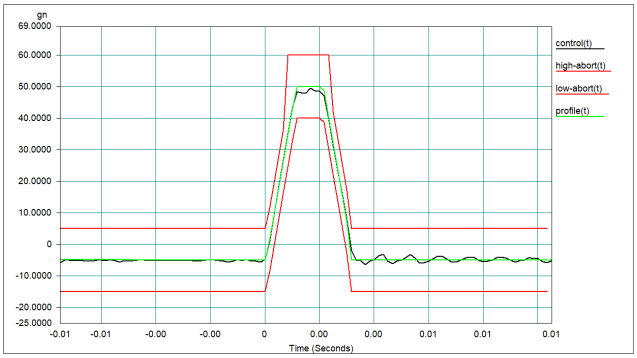
Z axis - 20g Sine Vibration Plot for 120 minutes

2.3.3. Shock

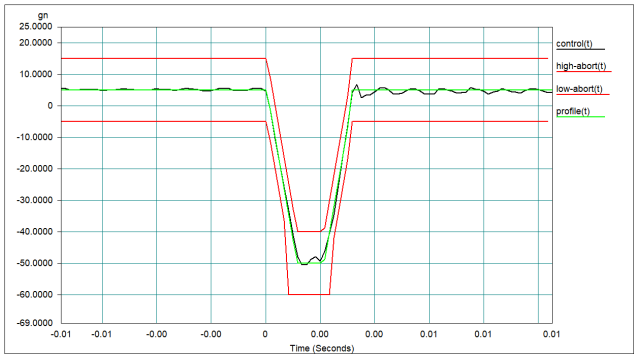
Methodology: The sample was subjected to a Shock Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Ea, under the following conditions:

- Severity = 100g for Z axis, 50g for X/Y axes (due to shaker table limitations)
- Duration = 1ms
- Shape = trapezoidal
- Number of shocks = 1 per direction; 2 per axis; 6 in total

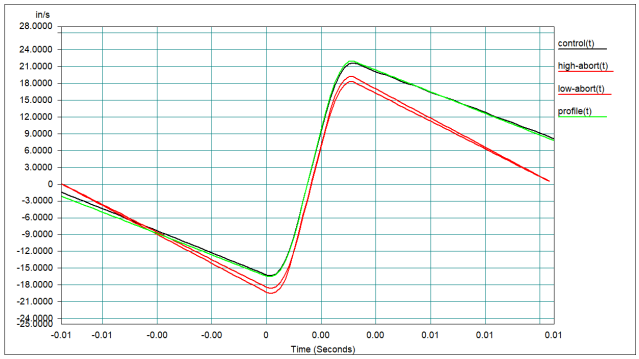
Results: In each plot, the black line is the Control.



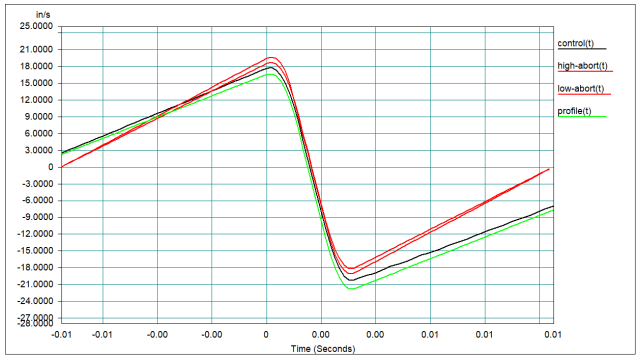
X axis - Positive shock pulse



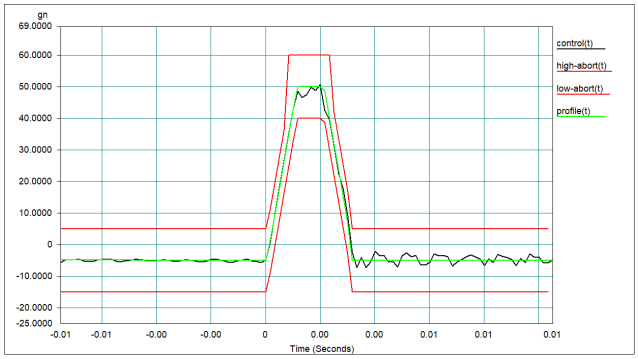
X axis - Negative shock pulse



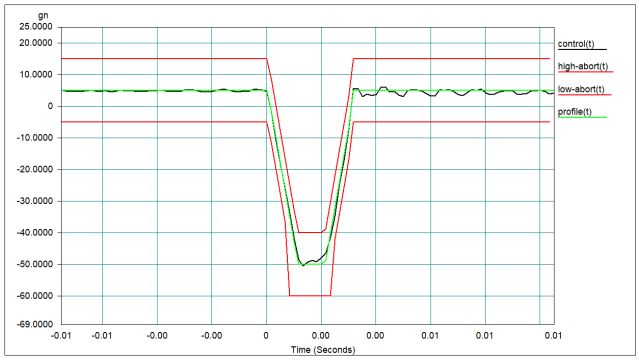
X axis - Positive velocity pulse



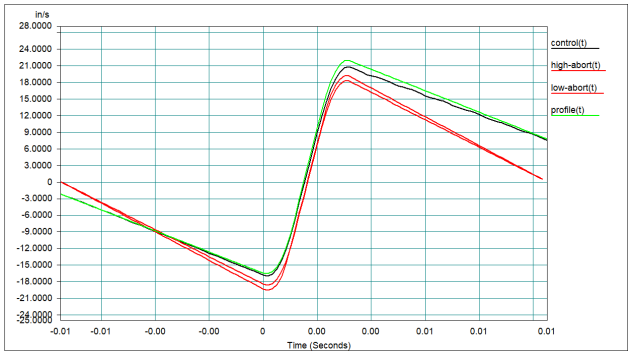
X axis - Negative velocity pulse



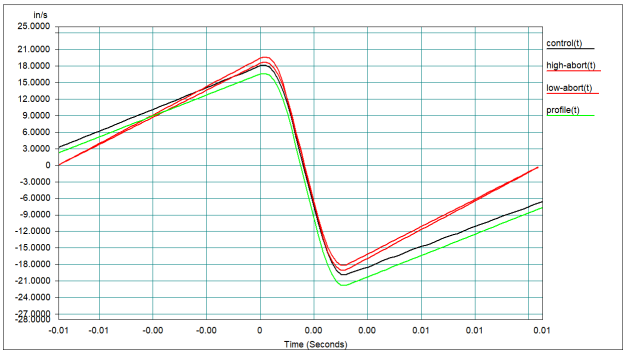
Y axis - Positive shock pulse



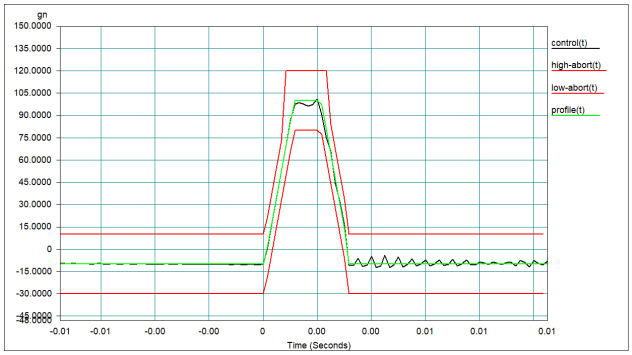
Y axis - Negative shock pulse



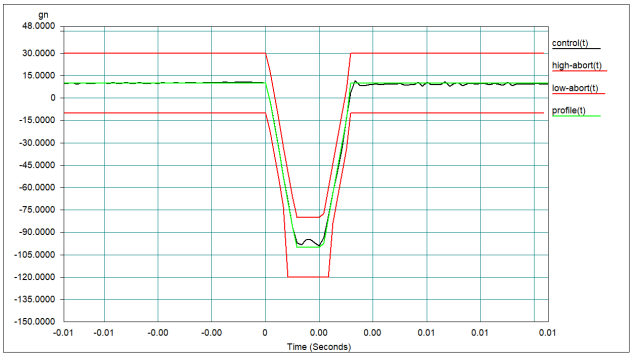
Y axis - Positive velocity pulse



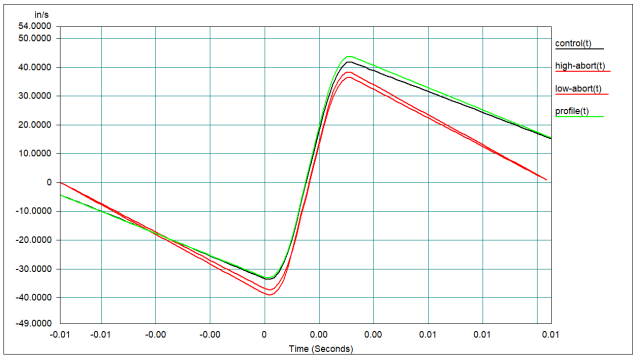
Y axis - Negative velocity pulse



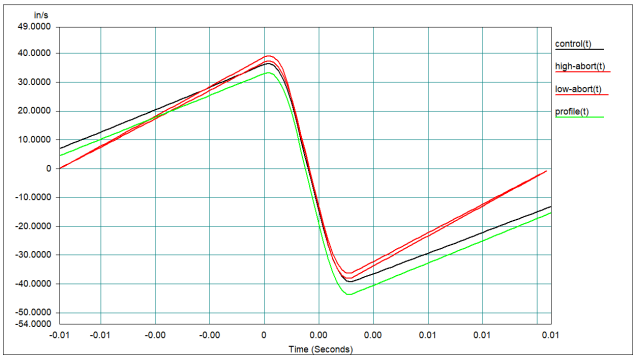
Z axis - Positive shock pulse



Z axis - Negative shock pulse



Z axis - Positive velocity pulse



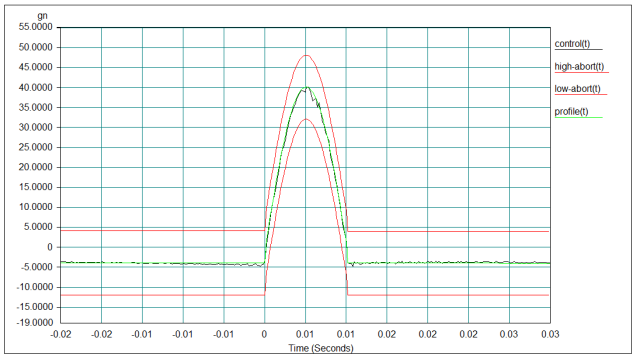
Z axis - Negative velocity pulse

2.3.4. Bump

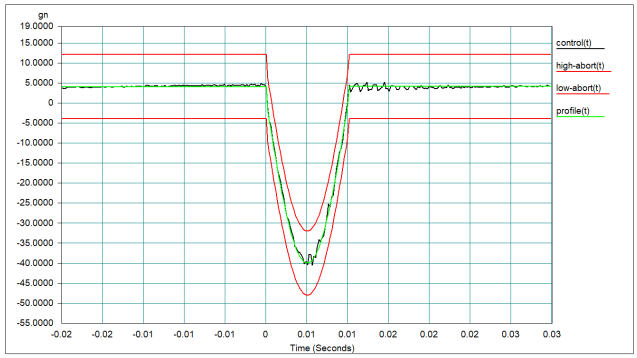
Methodology: The sample was subjected to a Bump Test carried out generally in accordance with BS 9525 and BS EN 60068-2-6 test Ea, under the following conditions:

- Severity = 40g
- Duration = 10ms
- Shape = half-sine
- Number of bumps = 666 per direction; 1,333 per axis; 4,000 in total

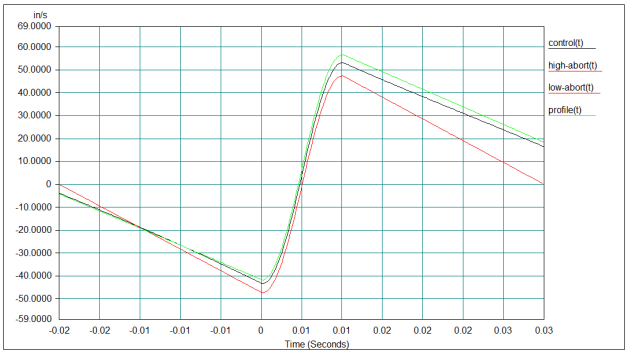
Results: In each plot, the black line is the Control.



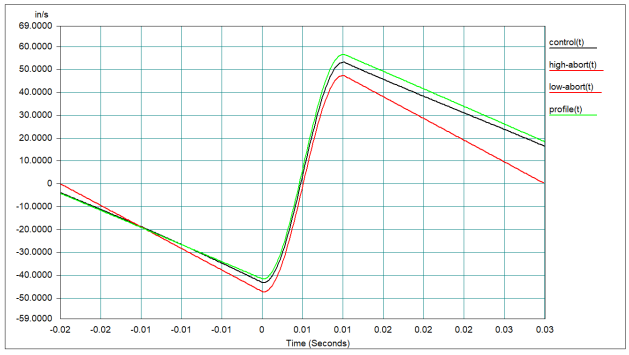
X axis - Positive bump pulse



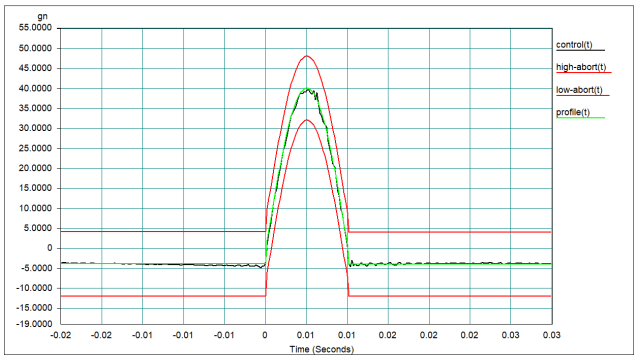
X axis - Negative bump pulse



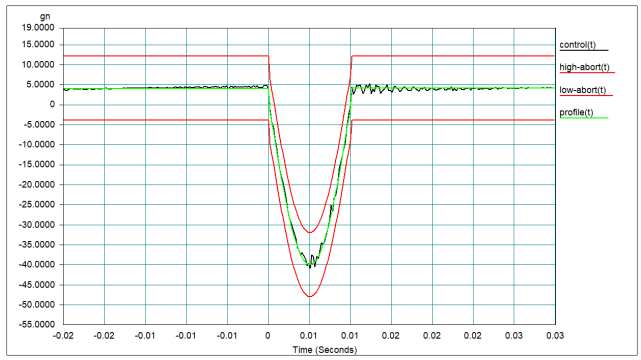
X axis - Positive velocity pulse



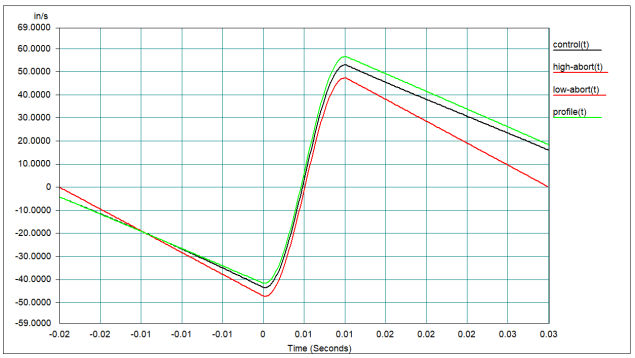
X axis - Negative velocity pulse



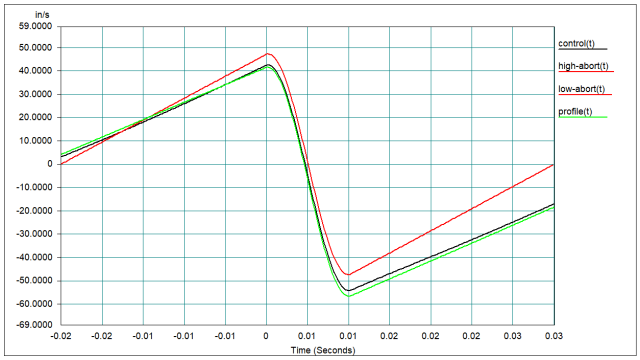
Y axis - Positive bump pulse



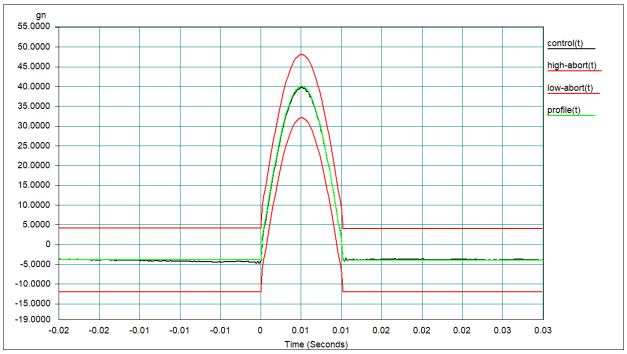
Y axis - Negative bump pulse



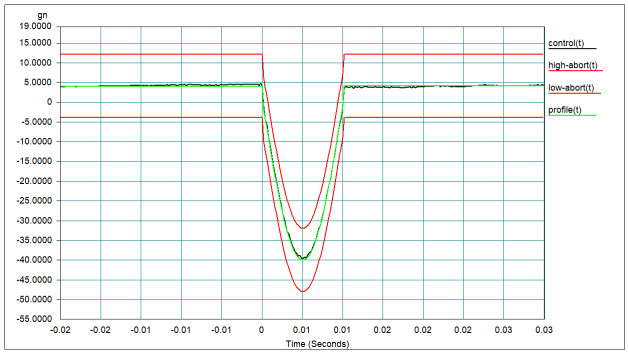
Y axis - Positive velocity pulse



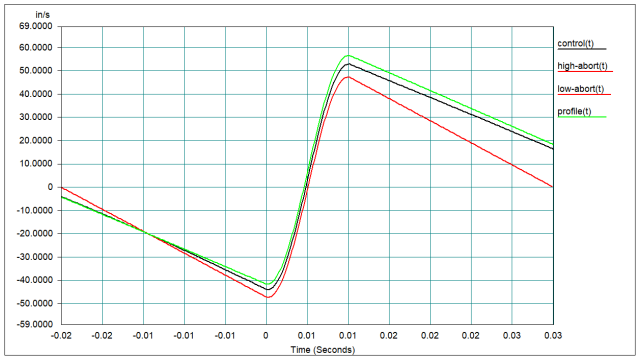
Y axis - Negative velocity pulse



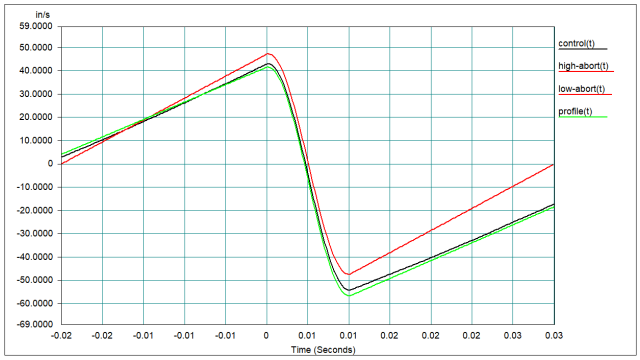
Z axis - Positive bump pulse



Z axis - Negative bump pulse



Z axis - Positive velocity pulse



Z axis - Negative velocity pulse