

TEST REPORT

Performance Testing Services



Testing Cert: 2268.01/2268.02

Test Report: 4677

Revision: Release

Test Report Date: 5/30/17
Sample Receipt Date: 5/24/17
Test Start Date: 5/25/17
Test Completion Date: 5/28/17

Customer: Kold Ban International
Mr. Dean Soule
8390 Pingree Road
L.I.T.H, IL 60156

Page 1 of 6

Test Request #: PO051917-006
PTS RFQ # 4677

CONDITION OF SAMPLES AS RECEIVED: Normal

Product(s) Tested

One (1) KAPower Super Capacitor Model 102400, S/N KSM02696.

Test Method/Description

Mechanical Vibration-Evaluation of machine vibration by measurements on no-rotating parts.

ISO 10816-1, 1995-12-15.

EMPTS010: mini-Hybrid Vibration Profiles. Twenty hours in each of the three axes (Vertical, Lateral and Longitudinal).
The test samples was monitored by a customer supplied USB logger.

Acceptance Level

There shall be no malfunction during the test. No loosening of the mounting bolts or fasteners shall be allowed. No cracking of the base materials, welds or bolted joints. PTS will make only visual observations of the part during and upon completion of the testing. Kold Ban International is responsible for monitoring the unit for functionally during the testing.

Test Results

The test sample was subjected to twenty (20) hours of random vibration in the Vertical, Lateral and Longitudinal axes. The sample was monitored by a Kold Ban International supplied USB logger during testing to insure it remained functional throughout the testing. No obvious physical discrepancies were observed by Performance Testing Services during or upon completion of the testing. No loosening of the mounting bolts or fasteners, no cracking of the base materials, welds or bolted joints was observed during or upon completion of the testing. Please see the test setup photos, vibration control plots and the customer supplied vibration profiles contained in this report for a record of the testing. The sample was returned to Kold Ban International for further evaluation.

Test Equipment Used

Equipment#	Serial Number	Description	Calibration Due
035	LW205169	PCB Accelerometer	8/29/18
009	0e051b	Vibration Research Vibration Controller	4/16/19
005	218	UD Vertical Shaker	NCD
001	10117	Thermotron V/H Shaker	NCD

Testing Conducted By: 
Brian Boyer
Lab Manager

Performance Testing Services 5241 Edgeway Suite B Allendale, MI 49401 (616) 895-1244 Fax: (616) 895-1244

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TEST RESULTS IN THIS TEST SUMMARY REPORT RELATE ONLY TO THE SPECIFIC TEST SAMPLE(S) LISTED!

TEST REPORT

Performance Testing Services

Test Report: 4677

Page 2 of 6

Test Setup Photos.



Vertical (Z) Axis Test Setup



Longitudinal Axis Test Setup



Lateral Axis Test Setup

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TEST REPORT

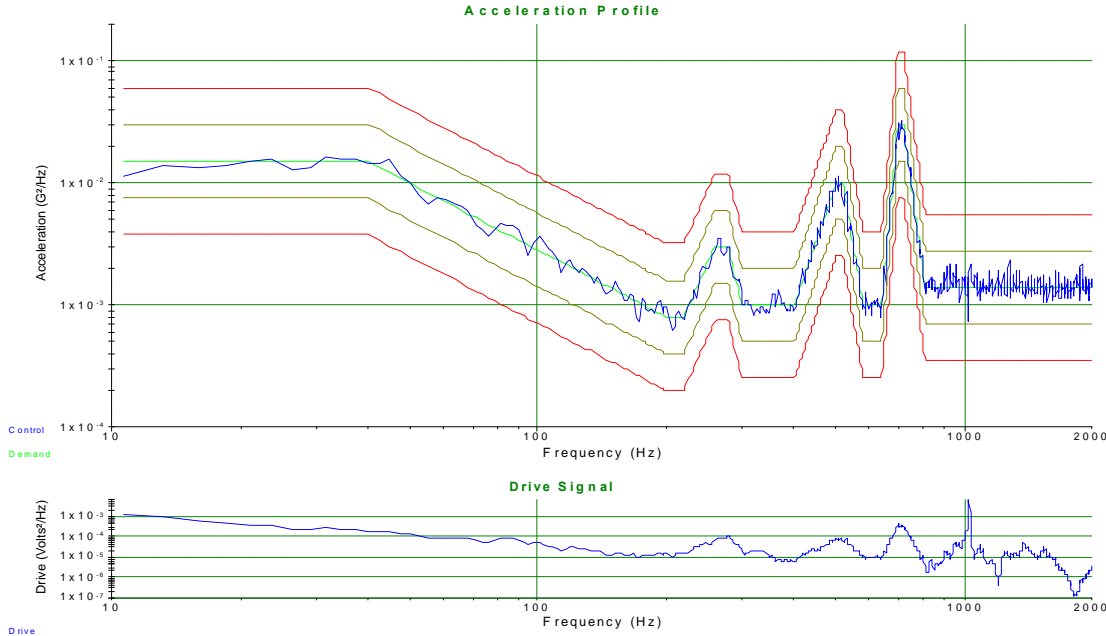
Performance Testing Services

Test Report: 4677

Page 3 of 6

Vertical Vibration Control Plot

Data stored on May 25, 2017 08:12:18



Breakpoint table

Frequency	G²/Hz	dB/Octave
10 Hz	0.015	0
40 Hz	0.015	-5.483
200 Hz	0.0008	0
220 Hz	0.0008	23.82
260 Hz	0.003	0
280 Hz	0.003	-47.93
300 Hz	0.001	0
400 Hz	0.001	31.06
500 Hz	0.01	0
520 Hz	0.01	-63.48
580 Hz	0.001	0
640 Hz	0.001	114.3
700 Hz	0.03	0
720 Hz	0.03	-78.33
810 Hz	0.0014	0
2000 Hz	0.0014	

Test level schedule:

	Duration	Level
1)	20:00:00	100 %

** Test started May 24, 2017 10:36:56, running for 20:00:16
 ** Current level: 1, running at 100 % for 20:00:00 of 20:00:00

Measurements:

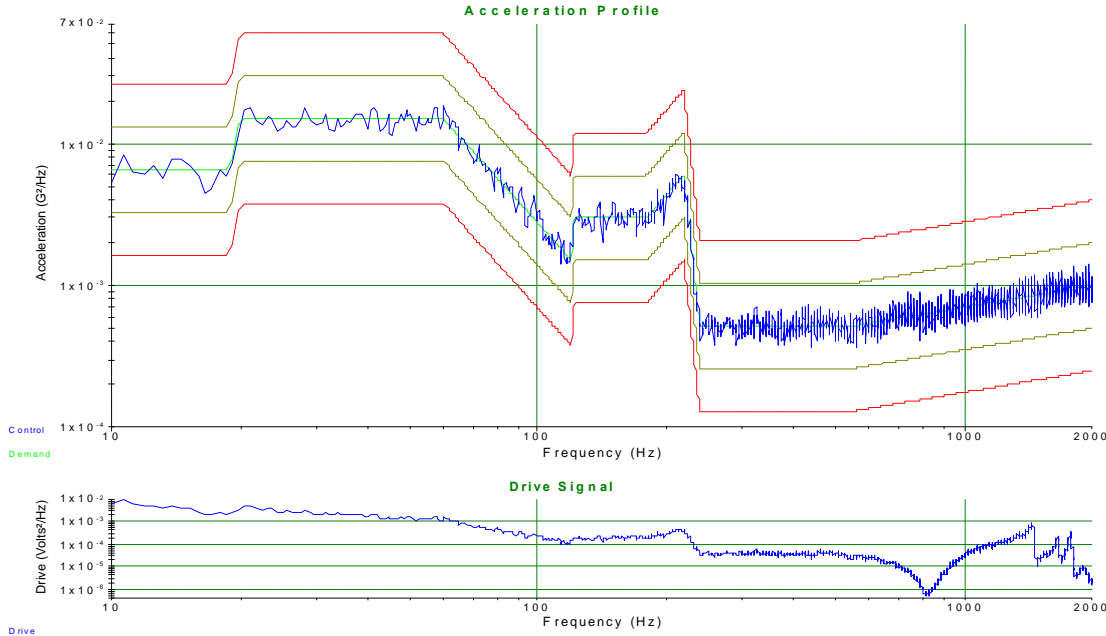
Demand: 2.405 G RMS 0.1438 in pk-pk
 Control: 2.404 G RMS 0.1605 in pk-pk

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Longitudinal Vibration Control Plot

Data stored on May 26, 2017 08:42:16



Breakpoint table

Frequency	G²/Hz	dB/Octave
10 Hz	0.0065	0
19 Hz	0.0065	49.08
20 Hz	0.015	0
60 Hz	0.015	-10
120 Hz	0.0015	126.2
122 Hz	0.003	0
180 Hz	0.003	10.4
220 Hz	0.006	-84.61
240 Hz	0.006	0
550 Hz	0.00052	1.525
2000 Hz	0.00052	

Test level schedule:

Duration	Level
1) 20:00:00	100 %

** Test started May 25, 2017 09:53:07, running for 20:00:28

** Current level: 1, running at 100 % for 20:00:00 of 20:00:00

Measurements:

Demand: 1.677 G RMS	0.09834 in pk-pk
Control: 1.674 G RMS	0.1033 in pk-pk

Lateral Vibration Control Plot

Data stored on May 27, 2017 12:11:48



Breakpoint table

Frequency	G ² /Hz	dB/Octave
10 Hz	0.00013	7.548
19 Hz	0.00065	113.6
20 Hz	0.0045	0
50 Hz	0.0045	-8.532
130 Hz	0.0003	0
180 Hz	0.0003	28.46
220 Hz	0.002	0
700 Hz	0.002	-29.1
800 Hz	0.00055	0
2000 Hz	0.00055	

Test level schedule:

	Duration	Level
1)	20:00:00	100 %
** Test started May 26, 2017 08:48:04, running for 20:00:29		
** Current level: 1, running at 100 % for 20:00:00 of 20:00:00		

Measurements:

Demand: 1.423 G RMS	0.0306 in pk-pk
Control: 1.422 G RMS	0.03053 in pk-pk

TEST REPORT

Performance Testing Services

Test Report: 4677

Page 6 of 6

Customer Supplied Vibration Specification

EMPTS010: mini-Hybrid Vibration Profile

Revision: A

Test Requirement	Specification	Acceptance Criteria
Set-Up	Set-up dependent on specific vehicle configuration. Test for 20 hours in each axis.	There shall be no malfunction during the test. No loosening of the mounting bolts or fasteners shall be allowed during a visual inspection. No cracking of base materials, welds, or bolted joints.
Profile	Specification	
Vertical		
frequency (Hz)	vertical (g²/Hz)	
10	0.015	
40	0.015	
200	0.0008	
220	0.0008	
260	0.003	
280	0.003	
300	0.001	
400	0.001	
500	0.01	
520	0.01	
580	0.001	
640	0.001	
700	0.03	
720	0.03	
810	0.0014	
2000	0.0014	
RMS value		
2.39		
Lateral		
frequency (Hz)	lateral (g²/Hz)	
10	0.00013	
19	0.00065	
20	0.0045	
50	0.0045	
130	0.0003	
180	0.0003	
220	0.002	
700	0.002	
800	0.00055	
2000	0.00055	
RMS value		
1.422		
Longitudinal		
frequency	longitudinal (g²/Hz)	
10	0.0065	
19	0.0065	
20	0.015	
60	0.015	
120	0.0015	
122	0.003	
180	0.003	
220	0.006	
240	0.006	
550	0.00052	
2000	0.00052	
RMS value		
1.68		

Notes:

Rev A

Initial Issue

9/7/2011