

TEST REPORT

Report No. : SGS-R13-1066-EN

Applicant : SAMSUNG TECHWIN Co, Ltd

Address : Samsung Techwin R&D Center, 701, Sampyeong-dong,
Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

Product : Mobile NVR

Model : SRM-872

Environment : Temp. (20 ± 5) °C, Humidity (70 ± 5) % R.H.

Test Date : September 11, 2013

Standard : MIL-STD-810F: 2003 Method 514.5 Figure 514.5C-3
MIL-STD-810F: 2003 Method 516.5 Table 516.5- II

Test Result : Refer to the attached document

Use of report : Validation

This is certified that the above mentioned products have been tested for the sample provided by client.

Confirmation	Tested by	Approved by
	Name : An, Hyo-kyung	Name : Kim, In-kee

- ※ The test results is based on the test conducted on the test sample, which was requested by the client.
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September 13, 2013

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Summary of Test Results

Mobile NVR / SRM-872	
TEST ITEM	TEST RESULT
Vibration Test	No abnormal was found
Shock Test	No abnormal was found

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1. Overview

As requested by the client, this test was conducted on test sample according to the test specification presented by the client.

2. Product

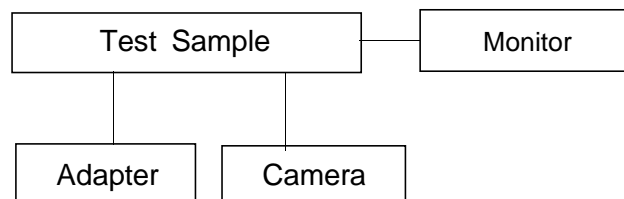
2.1 Description

Applicant : SAMSUNG TECHWIN Co, Ltd
 Manufacturer : SAMSUNG TECHWIN Co, Ltd
 Product : Mobile NVR
 Model : SRM-872
 Serial No. : N/A
 Input Voltage : N/A

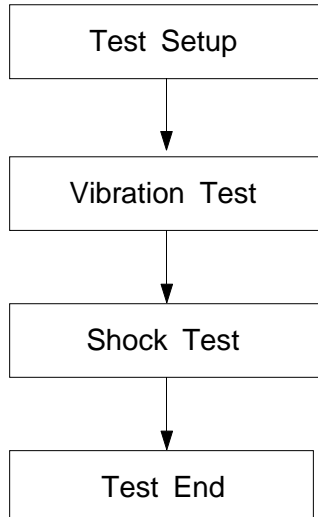
2.2 Photograph



2.3 System Configuration



3. Test Process



4. Test Condition & Test Result

Refer to each test report (Next page)

4.1 Vibration Test

Applicant	SAMSUNG TECHWIN Co, Ltd	Dept. in charge	Reliability Test Team
Product	Mobile NVR	Tester	An, Hyo-Kyung (+82-31-548-0727)
Model	SRM-872	Date	September 11, 2013
Serial No.	N/A		
Standard	MIL-STD-810F: 2003 Method 514.5 Figure 514.5C-3	Page	9

(1) Test Conditions

- 1) Test type : Random
- 2) Frequency : (5 ~ 500) Hz
- 3) Acceleration : Z - 2.20 m/s² r.m.s. (21.56 m/s² r.m.s.)
X - 1.62 m/s² r.m.s. (15.876 m/s² r.m.s.)
Y - 2.05 m/s² r.m.s. (20.09 m/s² r.m.s.)
- 4) Test time : Total 2 h (each axis 40 min)
- 5) Test axis : Vertical (Z), Transverse (X), Longitudinal (Y)
- 6) Check time : During the test
- 7) Sample condition : Unpackaged product / Operation
- 8) Sample quantity : 1 EA

(2) Environment Condition : Temperature (20 ± 5) °C, Humidity (70 ± 5) % R.H.


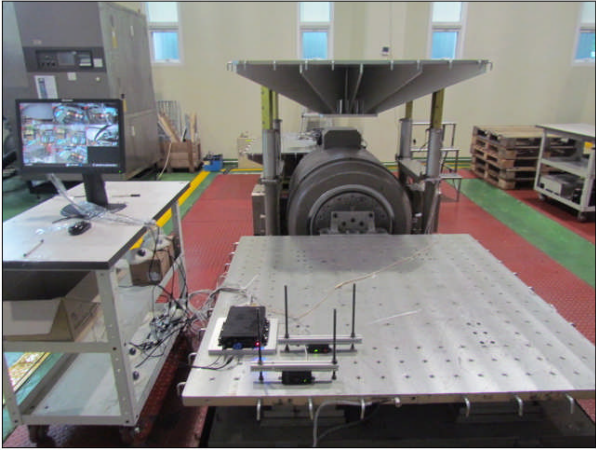
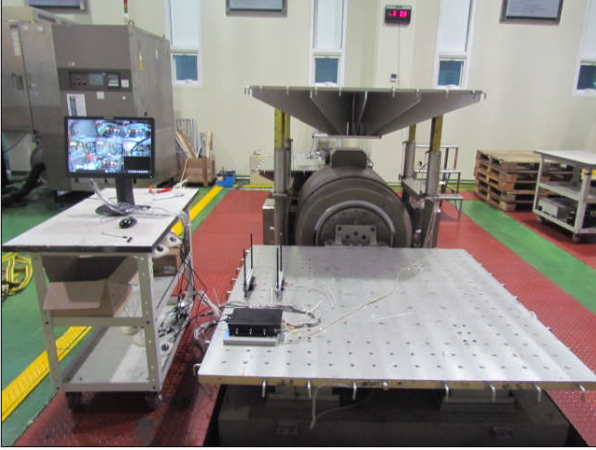
(3) Test Method

- 1) Perform a visual inspection and an operational check for the specimen.
- 2) Fix the specimen on the vibration table.
- 3) Operate the vibration tester.
- 4) Repeat from steps 1) to step 3) for each required axis.
- 5) Perform a final visual inspection and an operational check for the specimen.

(4) PSD Levels

Vertical		Transverse		Longitudinal	
Frequency [Hz]	PSD Levels [g _n ² /Hz]	Frequency [Hz]	PSD Levels [g _n ² /Hz]	Frequency [Hz]	PSD Levels [g _n ² /Hz]
5	0.236 6	5	0.134 4	5	0.059 3
8	0.688 9	7	0.107 5	8	0.049 9
12	0.050 7	8	0.127 9	15	0.025 5
21	0.020 2	14	0.036 6	16	0.034 4
23	0.030 1	16	0.048 5	20	0.013 4
24	0.010 9	17	0.032 6	23	0.060 8
26	0.015 0	19	0.083 6	25	0.014 8
49	0.003 8	23	0.014 7	37	0.004 0
51	0.005 4	116	0.000 8	41	0.005 9
61	0.002 3	145	0.001 3	49	0.001 6
69	0.011 1	164	0.000 9	63	0.001 1
74	0.002 9	201	0.000 9	69	0.004 0
78	0.004 8	270	0.005 1	78	0.000 8
84	0.003 3	298	0.002 1	94	0.002 0
90	0.005 2	364	0.009 9	98	0.001 3
93	0.003 4	375	0.001 9	101	0.002 5
123	0.008 3	394	0.007 3	104	0.001 4
160	0.004 1	418	0.002 7	111	0.002 4
207	0.005 5	500	0.001 6	114	0.001 4
224	0.013 9			117	0.002 0
245	0.003 1			121	0.001 2
276	0.012 9			139	0.002 4
287	0.003 6			155	0.002 1
353	0.002 7			161	0.003 4
375	0.004 9			205	0.004 2
500	0.001 0			247	0.030 3
				257	0.002 7
				293	0.009 2
				330	0.011 6
				353	0.023 1
				379	0.008 3
				427	0.022 0
				500	0.001 4
2.20 g _n r.m.s. (21.56 m/s ² r.m.s.)		1.62 g _n r.m.s. (15.87 m/s ² r.m.s.)		2.05 g _n r.m.s. (12.09 m/s ² r.m.s.)	

(4) Test Photograph

Test axis	Test photograph
Vertical (Z)	
Transverse (X)	
Longitudinal (Y)	

(5) Test Equipment

Description	Manufacturer and Model	Serial Number	The due date of next Calibration	Calibration Laboratory
Vibration Tester	Shinken/G-0215NS	SG-4589	May 16, 2014	SICT
Vibration Tester	Shinken/G-0310L	SG-4763	May 16, 2014	SICT
Accelerometer	Fujisera/S41SCB	0107	May 16, 2014	SICT

(6) Test Result

Check List	Test Result
1. Visual inspection -. Mechanical damage such as deformation, crack, separating, loosening of screw, etc.	No abnormal was found
2. Performance check -. Video output	Refer to ※ Appendix 1.

※ Appendix 1. Performance Check



<Z axis>

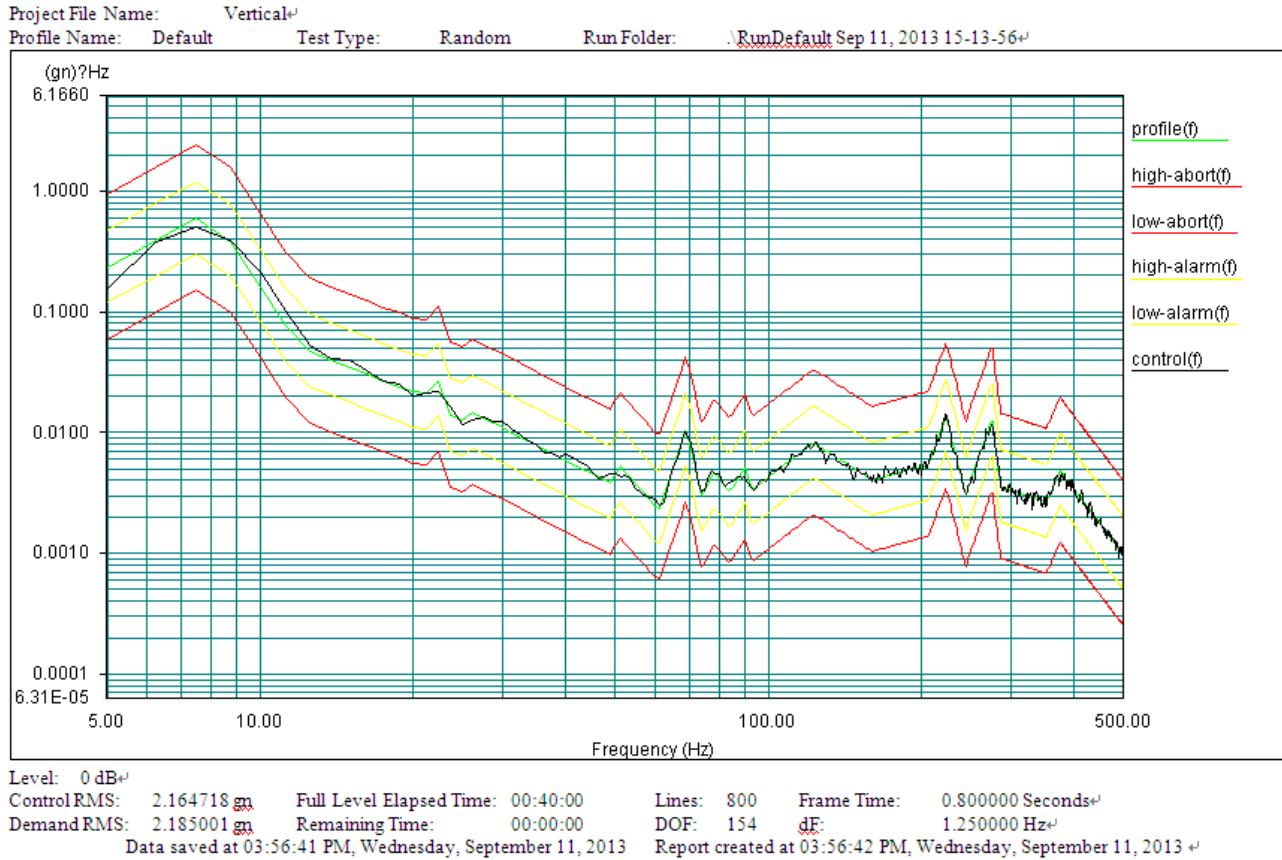


<X axis>



<Y axis>

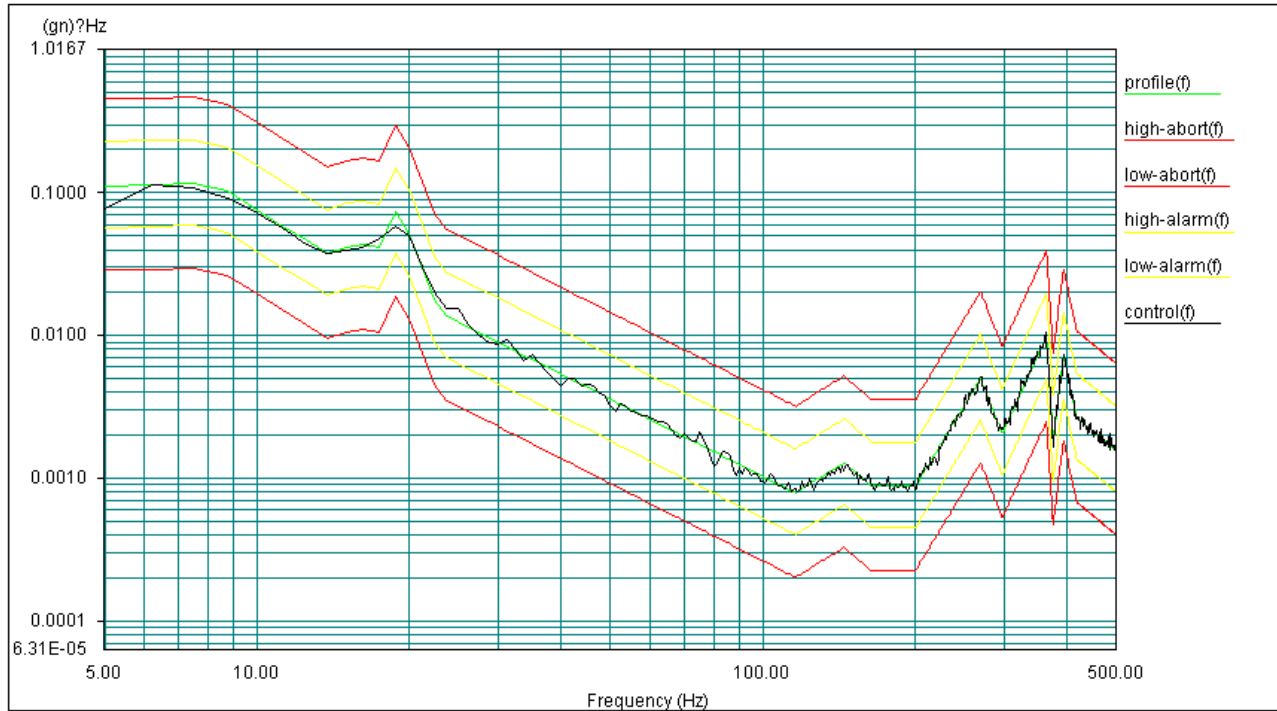
※ Appendix 1. Vibration Test Data _ Z axis



Vibration Test Data _ X axis

Project File Name: Transverse

Profile Name: Default Test Type: Random Run Folder: RunDefault Sep 11, 2013 17-56-38



Level: 0 dB

Control RMS: 1.587597 gn Full Level Elapsed Time: 00:40:00 Lines: 800 Frame Time: 0.800000 Seconds

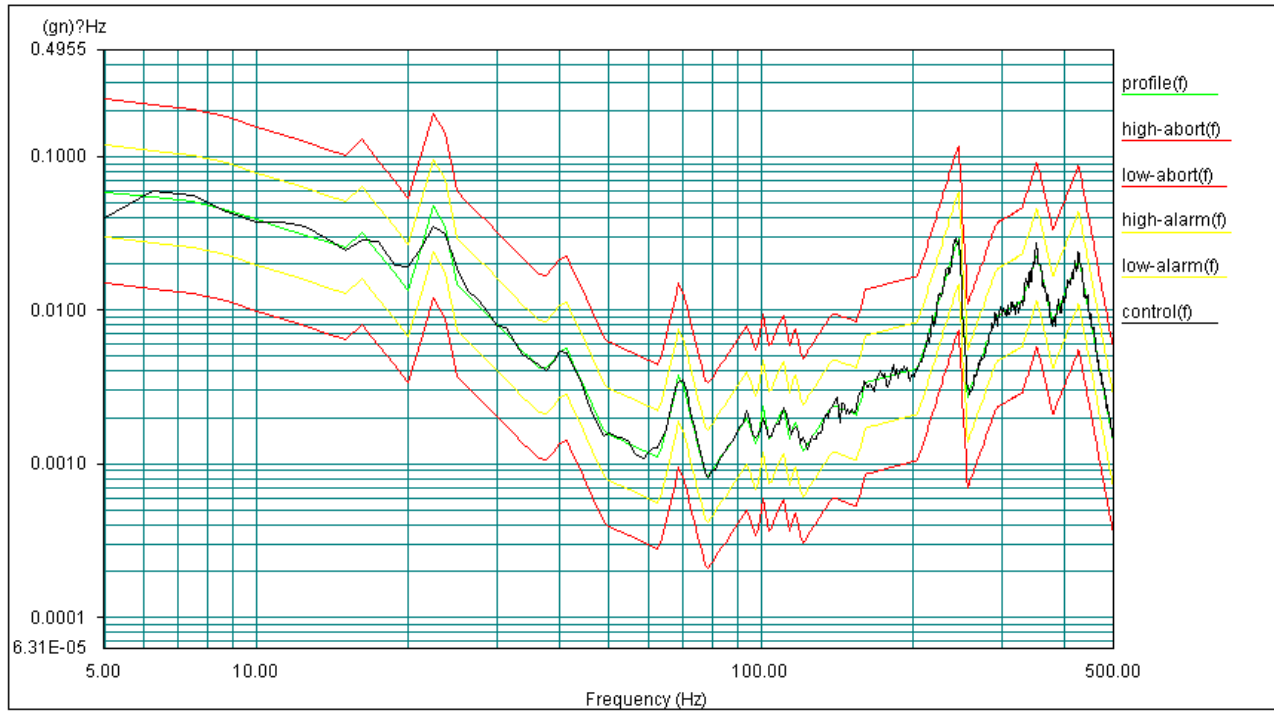
Demand RMS: 1.606937 gn Remaining Time: 00:00:00 DOF: 154 dF: 1.250000 Hz

Data saved at 06:38:15 PM, Wednesday, September 11, 2013 Report created at 06:38:17 PM, Wednesday, September 11, 2013

Vibration Test Data _ Y axis

Project File Name: Longitudinal.prj

Profile Name: Test Type: Random Run Folder: .RunDefault Sep 11, 2013 16:58:48



Level: 0 dB

Control RMS: 2.110476 gn Full Level Elapsed Time: 00:40:00 Lines: 800 Frame Time: 0.800000 Seconds

Demand RMS: 2.103446 gn Remaining Time: 00:00:00 DOF: 154 dF: 1.250000 Hz

Data saved at 05:23:17 PM, Wednesday, September 11, 2013 Report created at 05:23:18 PM, Wednesday, September 11, 2013

4.2 Shock Test

Applicant	SAMSUNG TECHWIN Co, Ltd	Dept. in charge	Reliability Test Team
Product	Mobile NVR	Tester	An, Hyo-Kyung (+82-31-548-0727)
Model	SRM-872	Date	September 11, 2013
Serial No.	N/A		
Standard	MIL-STD-810F: 2003 Method 516.5 Table 516.5- II	Page	11

(1) Test Conditions


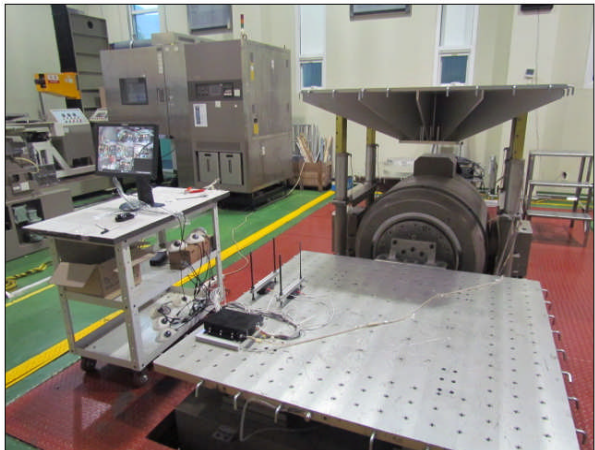

- 1) Test type : Sawtooth pulse
- 2) Acceleration : 196 m/s² (20 g_n)
- 3) Duration : 11 ms
- 4) Test time : 18 times in total (6 times in each axis : positive 3 / negative 3)
- 5) Test axis : Vertical (Z), Transverse (X), Longitudinal (Y)
- 6) Check time : During the test
- 7) Sample condition : Unpackaged product / Operation
- 8) Sample quantity : 1 EA

(2) Environment Condition : Temperature (20 ± 5) °C, Humidity (70 ± 5) % R.H.

(3) Test Method

- 1) Perform a visual inspection and an operational check for the specimen.
- 2) Fix the specimen on the vibration table.
- 3) Operate the vibration tester.
- 4) Repeat from steps 1) to step 3) for each required axis.
- 5) Perform a final visual inspection and an operational check for the specimen.

(4) Test Photograph

Test axis	Test photograph
Vertical (Z)	
Transverse (X)	
Longitudinal (Y)	

(5) Test Equipment

Description	Manufacturer and Model	Serial Number	The due date of next Calibration	Calibration Laboratory
Vibration Tester	Shinken/G-0215NS	SG-4589	May 16, 2014	SICT
Vibration Tester	Shinken/G-0310L	SG-4763	May 16, 2014	SICT
Accelerometer	Endevco/7201-10	15574	July 02, 2014	KTL

(6) Test Result

Check List	Test Result
1. Visual inspection -. Mechanical damage such as deformation, crack, separating, loosening of screw, etc.	No abnormal was found
2. Performance check -. Video output	Refer to ※ Appendix 1.

※ Appendix 1. Performance Check



<Z axis>

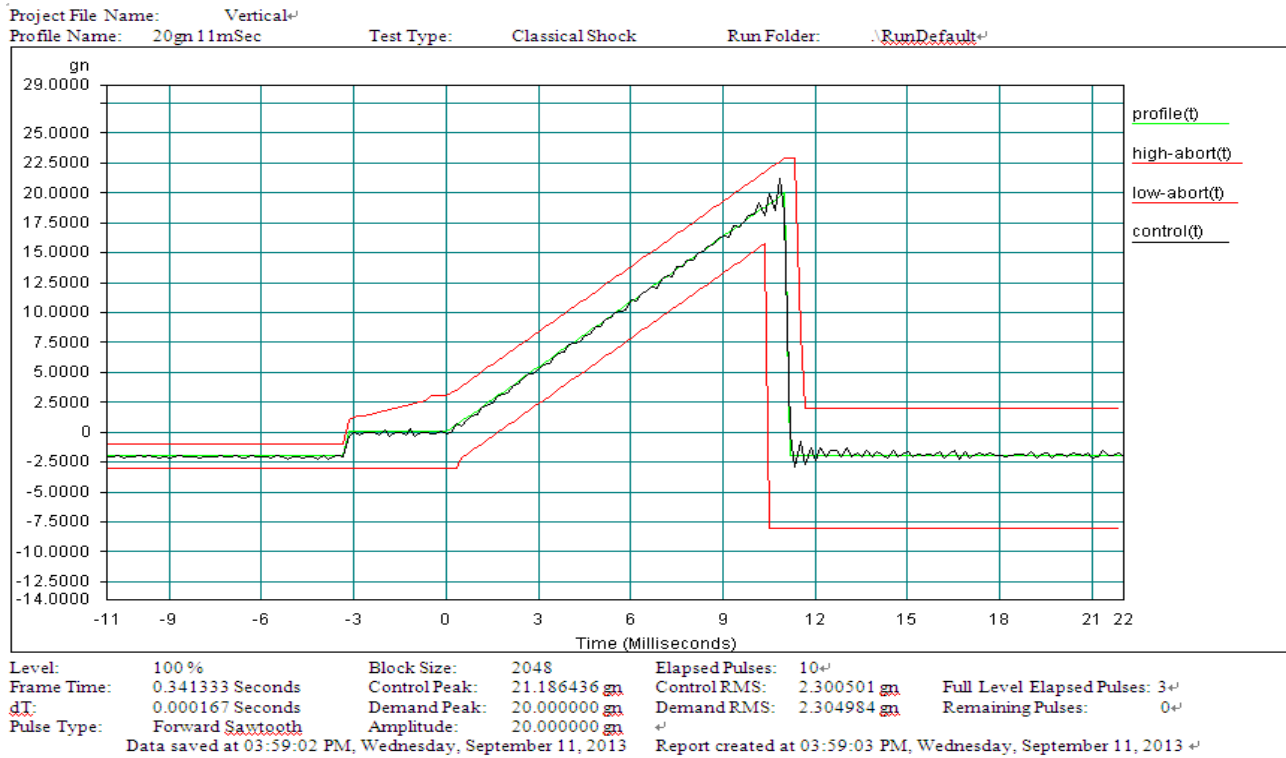


<X axis>



<Y axis>

※ Appendix 1. Shock Test Data _ Z axis

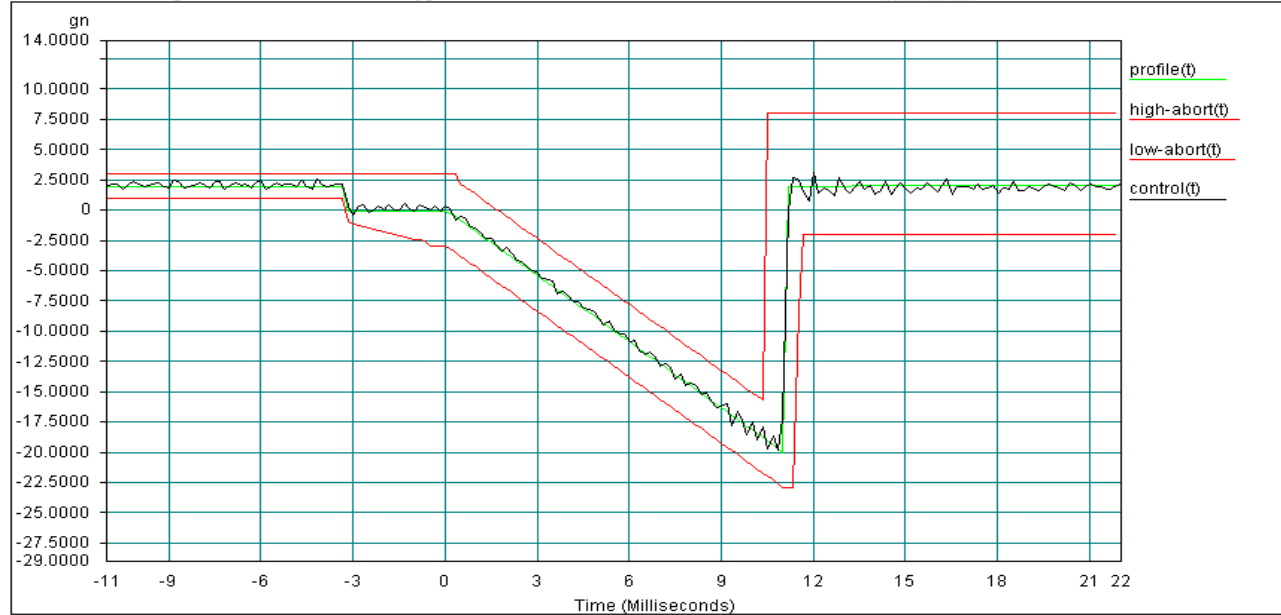


Project File Name: Vertical

Profile Name: 20gn11mSec

Test Type: Classical Shock

Run Folder: RunDefault



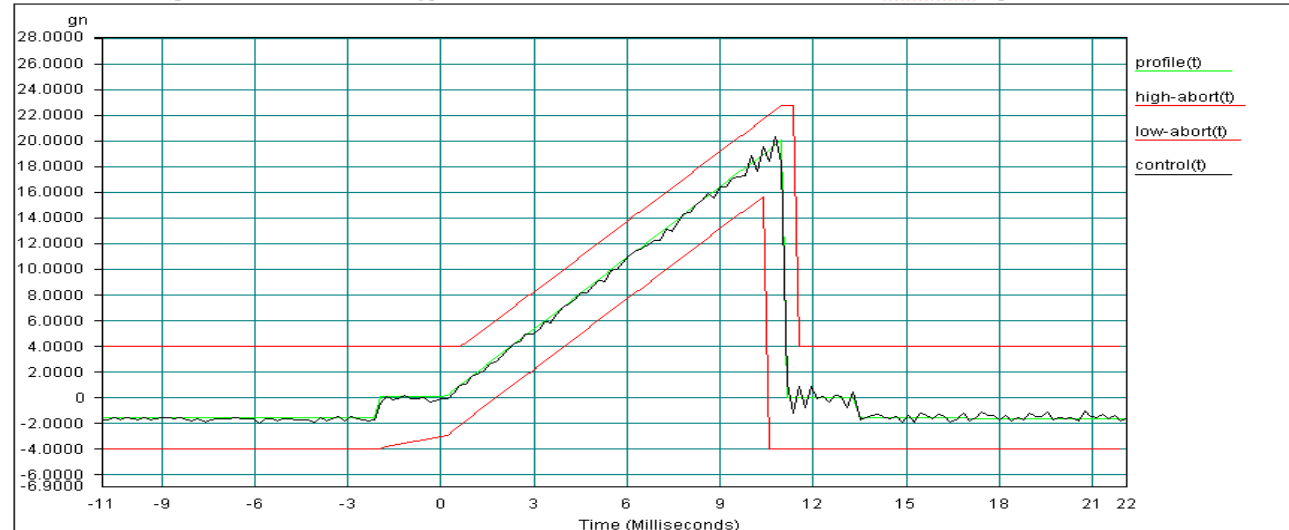
Level:	100 %	Block Size:	2048	Elapsed Pulses:	10
Frame Time:	0.341333 Seconds	Control Peak:	19.831570 gn	Control RMS:	2.281741 gn
dt:	0.000167 Seconds	Demand Peak:	20.000000 gn	Demand RMS:	2.304984 gn
Pulse Type:	Forward Sawtooth	Amplitude:	20.000000 gn	Full Level Elapsed Pulses:	3
				Remaining Pulses:	0

Data saved at 03:59:31 PM, Wednesday, September 11, 2013 Report created at 03:59:32 PM, Wednesday, September 11, 2013

Shock Test Data _ X axis

Project File Name: Transverse

Profile Name: 20gn 11mSec Test Type: Classical Shock Run Folder: RunDefault Sep 11, 2013 18:40:46



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 0.400000 Seconds Control Peak: 20.316486 gn Control RMS: 2.063832 gn Full Level Elapsed Pulses: 3

dT: 0.000195 Seconds Demand Peak: 20.000000 gn Demand RMS: 2.087563 gn Remaining Pulses: 0

Pulse Type: Forward Sawtooth Amplitude: 20.000000 gn

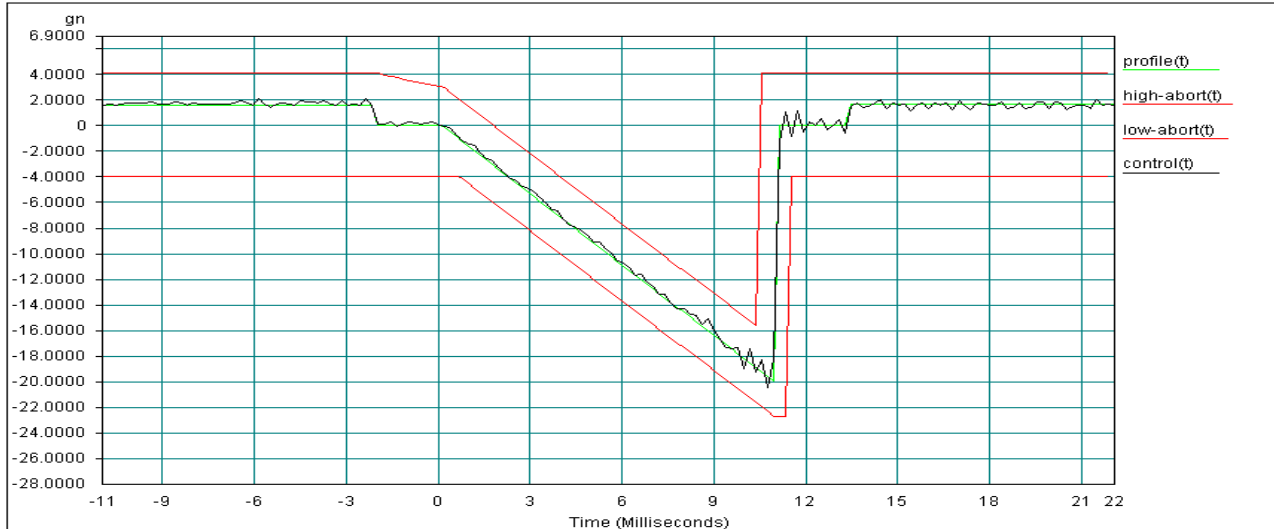
Data saved at 06:41:13 PM, Wednesday, September 11, 2013 Report created at 06:41:18 PM, Wednesday, September 11, 2013

Project File Name: Transverse

Profile Name: 20gn 11mSec

Test Type: Classical Shock

Run Folder: RunDefault Sep 11, 2013 18:41:29



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 0.400000 Seconds Control Peak: 20.495964 gn Control RMS: 2.064245 gn Full Level Elapsed Pulses: 3

dT: 0.000195 Seconds Demand Peak: 20.000000 gn Demand RMS: 2.087563 gn Remaining Pulses: 0

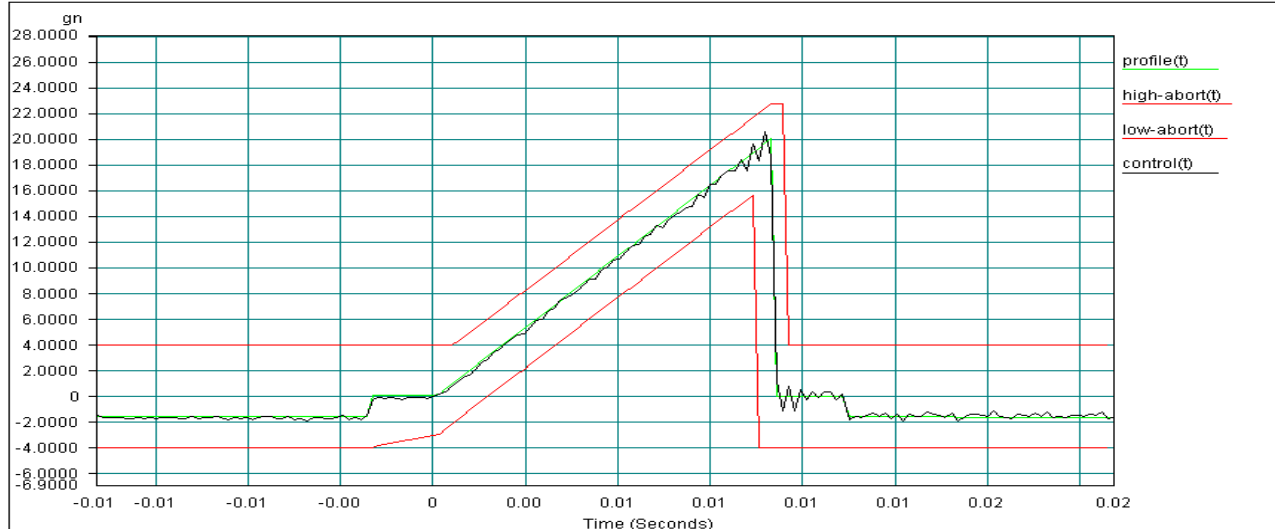
Pulse Type: Forward Sawtooth Amplitude: 20.000000 gn

Data saved at 06:41:46 PM, Wednesday, September 11, 2013 Report created at 06:41:47 PM, Wednesday, September 11, 2013

Shock Test Data _ Y axis

Project File Name: Longitudinal

Profile Name: 20gn 11mSec Test Type: Classical Shock Run Folder: RunDefault Sep 11, 2013 17-25-57



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 0.400000 Seconds Control Peak: 20.507010 gn Control RMS: 2.062366 gn Full Level Elapsed Pulses: 3

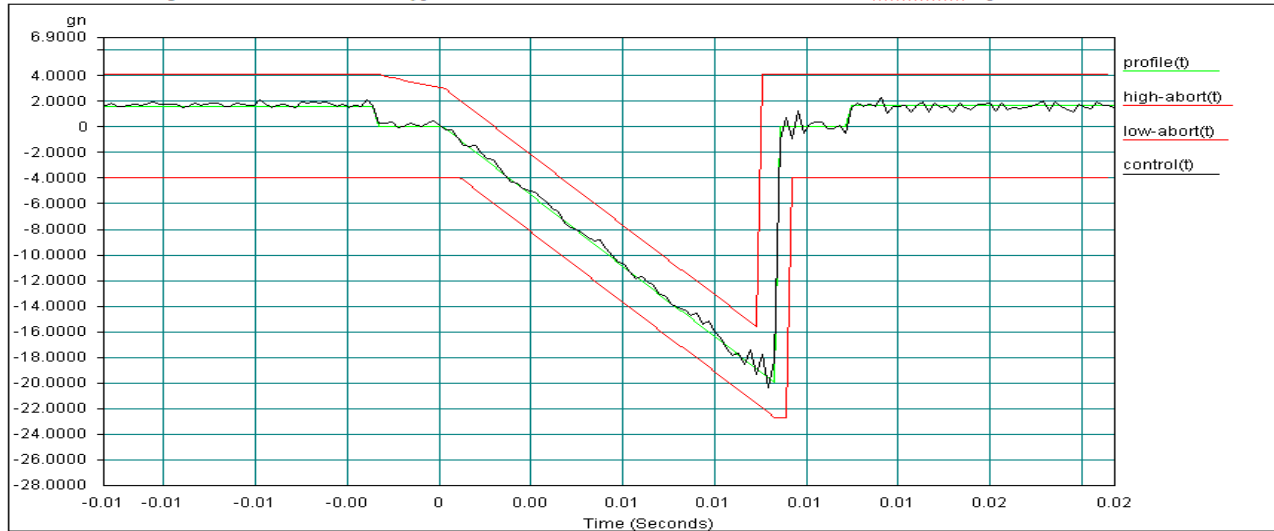
dT: 0.000195 Seconds Demand Peak: 20.000000 gn Demand RMS: 2.087563 gn Remaining Pulses: 0

Pulse Type: Forward Sawtooth Amplitude: 20.000000 gn

Data saved at 05:26:24 PM, Wednesday, September 11, 2013 Report created at 05:26:25 PM, Wednesday, September 11, 2013

Project File Name: Longitudinal

Profile Name: 20gn 11mSec Test Type: Classical Shock Run Folder: RunDefault Sep 11, 2013 17-26-33



Level: 100 % Block Size: 2048 Elapsed Pulses: 11

Frame Time: 0.400000 Seconds Control Peak: 20.352678 gn Control RMS: 2.061451 gn Full Level Elapsed Pulses: 3

dT: 0.000195 Seconds Demand Peak: 20.000000 gn Demand RMS: 2.087563 gn Remaining Pulses: 0

Pulse Type: Forward Sawtooth Amplitude: 20.000000 gn

Data saved at 05:26:53 PM, Wednesday, September 11, 2013 Report created at 05:26:53 PM, Wednesday, September 11, 2013