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VIBRATION LABORATORY

<http://www.kdi.tw>
<http://www.vibration.com.tw>
E-mail:service@kdi.tw

TESTING / INSPECTION REPORT

REPORT NO : VT-210303-1

COMPANY : Apacer Technology Inc.
ADDRESS : 1F., No.32, Zhongcheng Rd., Tucheng Dist.,
New Taipei City 236, Taiwan
TEL : 886-2-2267-8000
FAX : 886-2-2267-2261
SPECIMEN : PCIe M.2 2280
DATE OF RECEIVED : 2021/02/19
DATE OF TESTED : 2021/03/02

TEST / INSPECTION ITEMS : Vibration & Shock Test

REMARKS :

- The laboratory is accredited by ISO/IEC 17025 General Requirements for the Competence of Calibration and Testing Laboratory.
- The results only apply to the device under test.
- This report is 26 pages, and no part of it may be abstracted or reproduced.

金頓科

Test Engineer : <i>Shingai Wu</i>	
Approval Signatory : <i>2021.3.4 David Lee</i>	Laboratory Head : <i>Hsin Zai Chang</i>

TESTING / INSPECTION REPORT

TESTING EQUIPMENT :

- | | |
|-------------------------|---|
| 1.Vibration Tester | : KING DESIGN KD-9363EM-1500F2K-75N250,
S/N : R2109227101
Calibration Date : 2019/12/24 |
| 2.Controller | : Crystal Instruments Spider-81, S/N : 990048 |
| 3.Control Accelerometer | : PCB Piezotronics 356A32/NC, S/N : LW186351
Calibration Date : 2020/01/09 |
| 4.Shock Testing System | : KING DESIGN DP-1200-60, S/N : R2110086489 |
| 5.Controller | : DAS-105, S/N : 263210255 |
| 6.Accelerometer | : B&K 4398, S/N : 2209044 |
| 7.Shock Testing System | : KING DESIGN DP-1200-18, S/N : KDS02197998 |
| 8.Controller | : Lansmont TP-3, S/N : 0506-046 |
| 9.Accelerometer | : DYTRAN, Model : 3200B6, S/N : 8594 |

TEST ENVIRONMENT :

- | | |
|-------------------|----------------------|
| Temperature | : 20.2°C (25±10°C) |
| Relative Humidity | : 71% RH (50±25% RH) |

SPECIMEN :

- | | |
|----------|--------------|
| Model | : PX210-M280 |
| Quantity | : 1 unit |

TESTING / INSPECTION REPORT

TEST SPECIFICATION(1) :

Comply with MIL-STD 810G 514.6 category 7

Random Vibration test (Non-Operating)

Frequency : 15 Hz to 2,000 Hz

Accelerate : 4.02 g rms

P.S.D. : 0.01 g²/Hz (15 Hz)
: 0.01 g²/Hz (105.94 Hz)
: +6 dB/Oct (105.94 Hz to 150 Hz)
: 0.02 g²/Hz (150 Hz)
: 0.02 g²/Hz (500 Hz)
: -6 dB/Oct (500 Hz to 2,000 Hz)
: 0.0013 g²/Hz (2,000 Hz)

Test Axis : X, Y, Z axis

Test Time : 1 hour (Each axis)

Total Test Time : 3 hours

TEST SPECIFICATION(2) :

Comply with MIL-STD 810G 514.6 category 24

Random Vibration test (Operating)

Frequency : 20 Hz to 2,000 Hz

Accelerate : 7.69 g rms

P.S.D. : 0.04 g²/Hz (20 Hz to 1,000 Hz)
: -6 dB/Oct (1,000 Hz to 2,000 Hz)

Test Axis : X, Y, Z axis

Test Time : 1 hour (Each axis)

Total Test Time : 3 hours

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TEST SPECIFICATION(3) :

Comply with MIL-STD-883K Method 2002.5.

Wave Form : Half sine wave (Non-Operating)
 Acceleration : 1,500 g
 Duration Time : 0.5 ms
 No. of Shock : Each axis 3 times
 Shock Direction : $\pm X$, $\pm Y$, $\pm Z$ axis

TEST SPECIFICATION(4) :

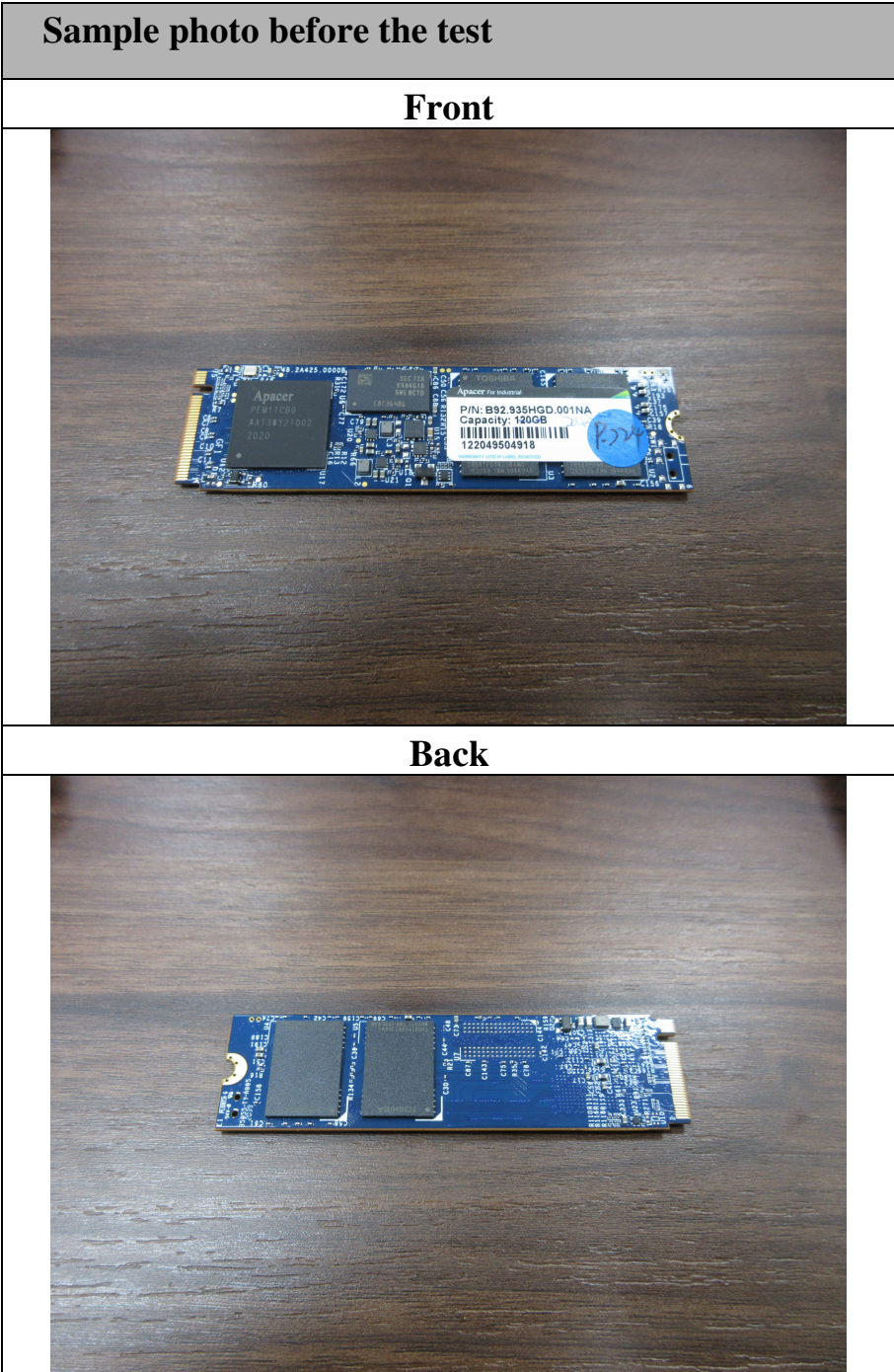
Comply with MIL-STD-202G, Method 213B

Wave Form : Half sine wave (Operating)
 Acceleration : 50 g
 Duration Time : 11 ms
 No. of Shock : Each axis 3 times
 Shock Direction : $\pm X$, $\pm Y$, $\pm Z$ axis

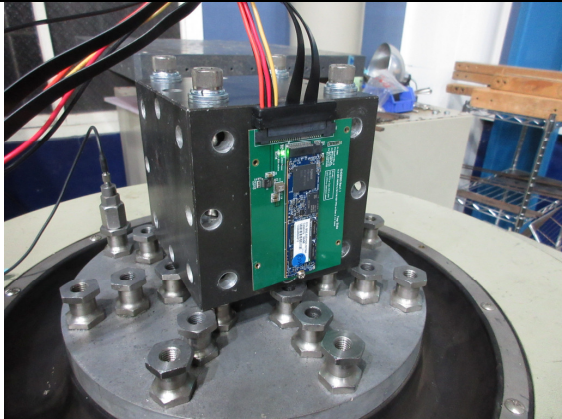

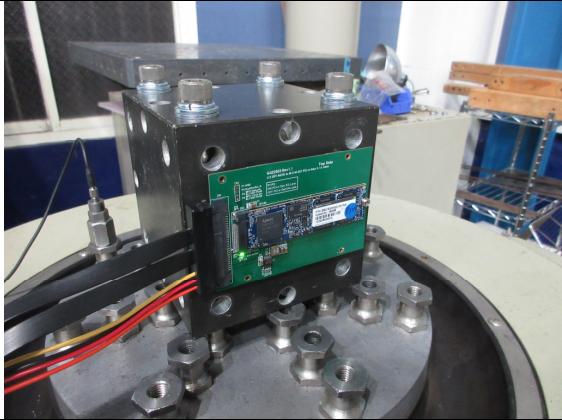
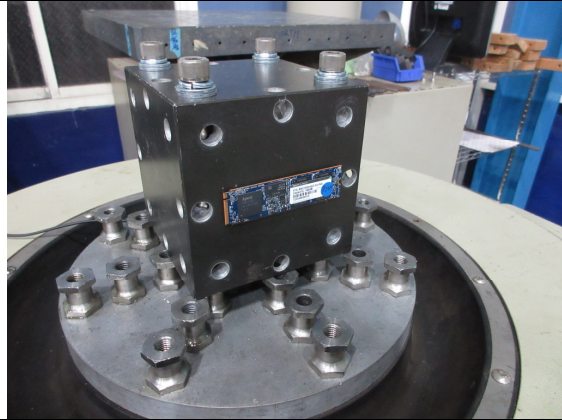
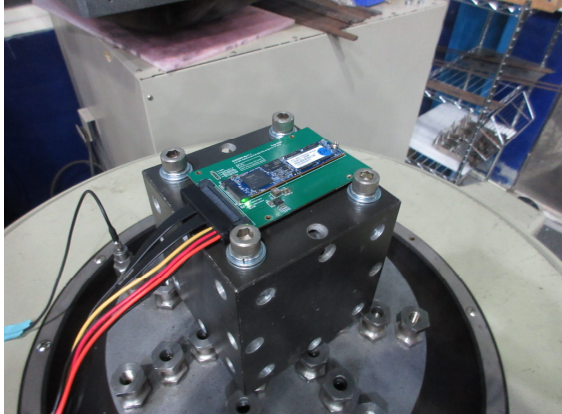
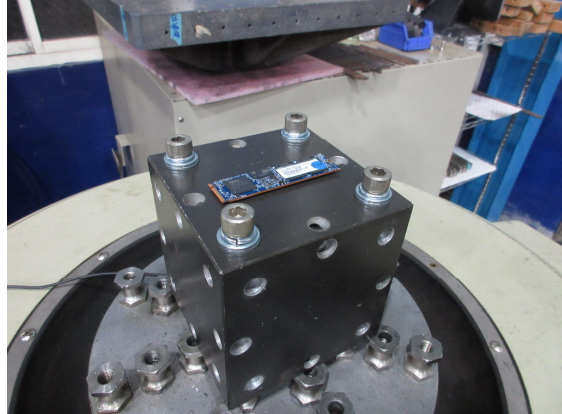
TEST RESULT :

Describe	PASS	FAIL	Non-Judgment
Function judgment	$\sqrt{(1)}$	---	---
Appearance check	$\sqrt{(2)}$	---	---
(1)-- After the test, burn-in function was normal.			
(2)-- No visible damages were found after the test.			

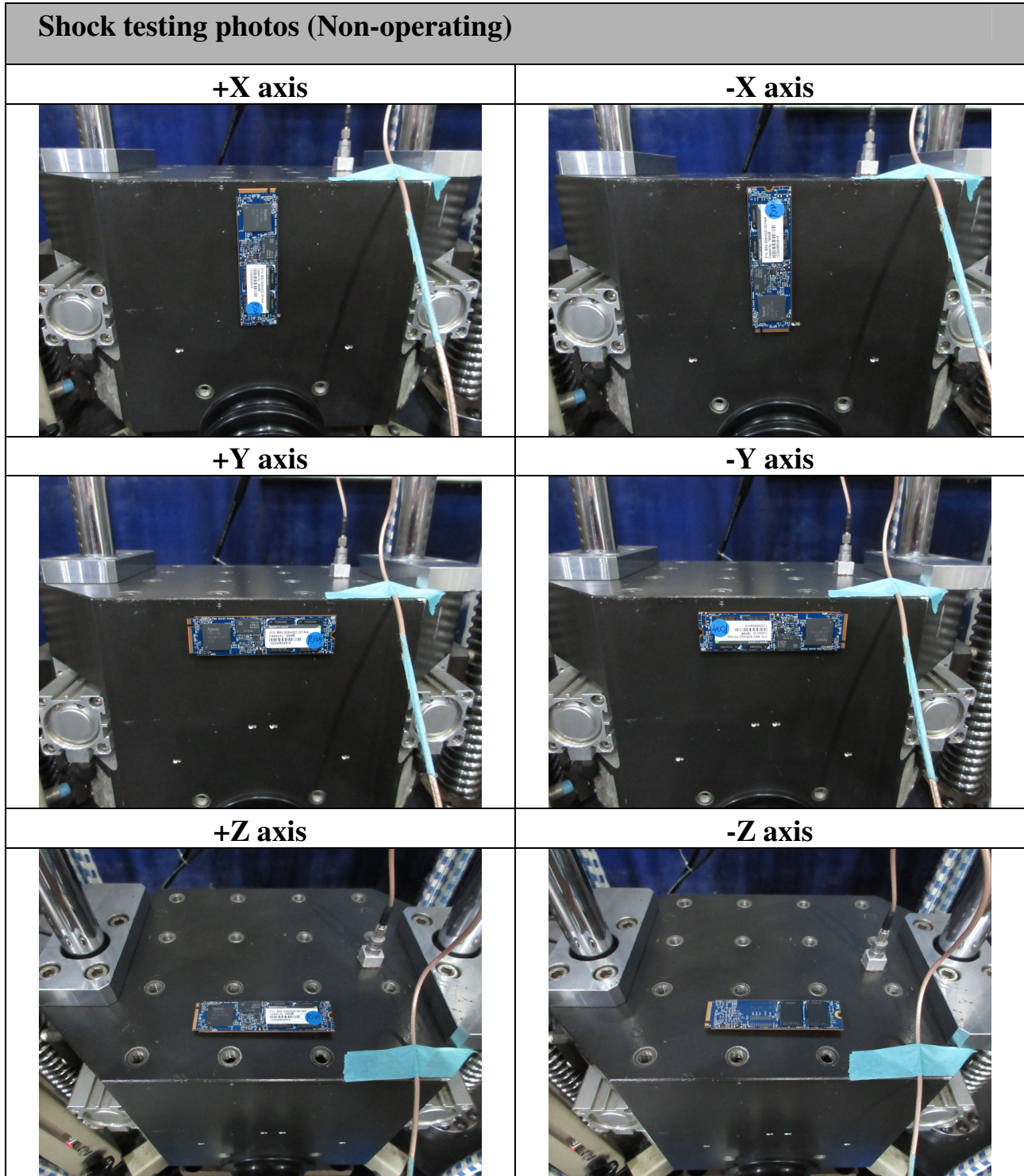
TESTING / INSPECTION REPORT



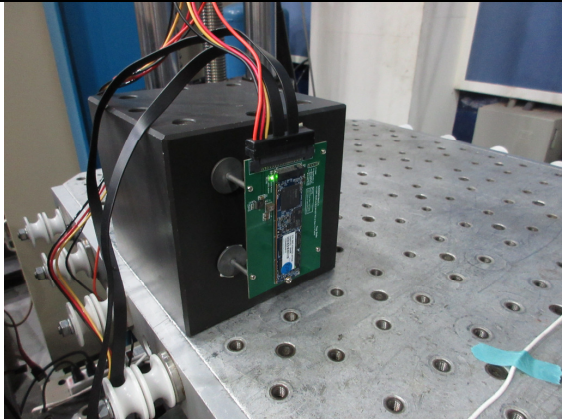
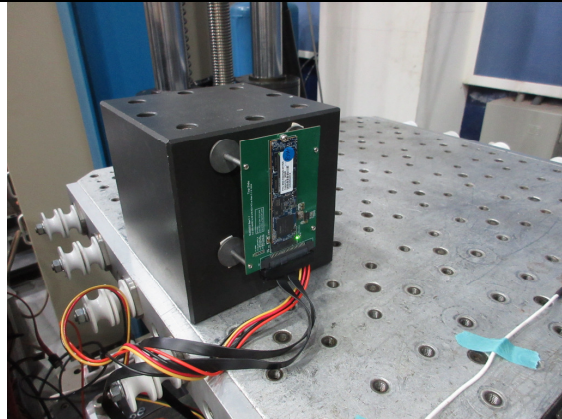
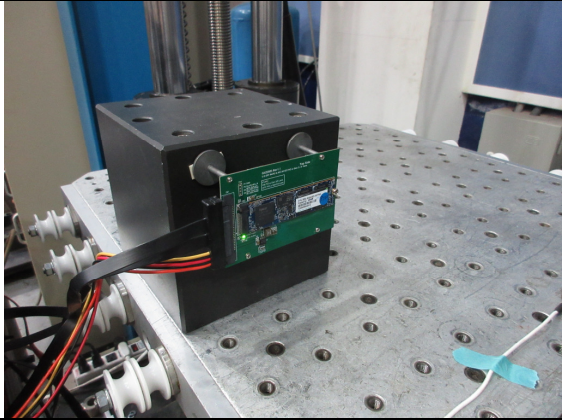
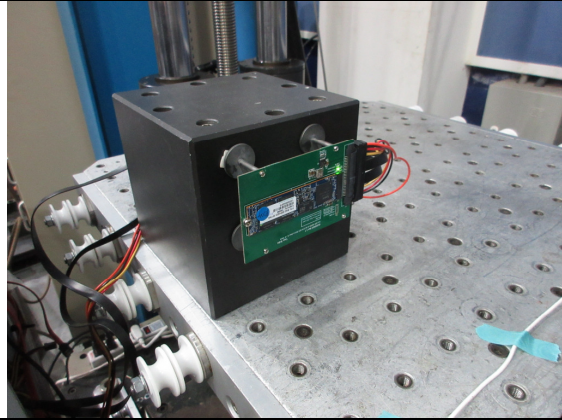
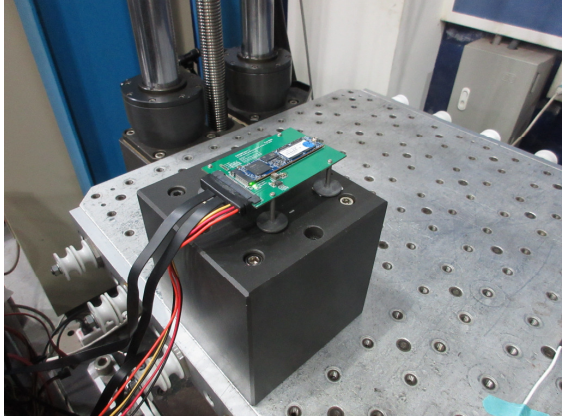
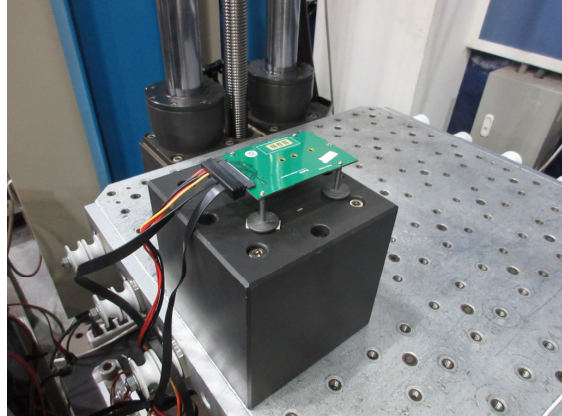
TESTING / INSPECTION REPORT

Vibration testing photos	
X axis (Operating)	X axis (Non-Operating)
	
Y axis (Operating)	Y axis (Non-Operating)
	
Z axis (Operating)	Z axis (Non-Operating)
	

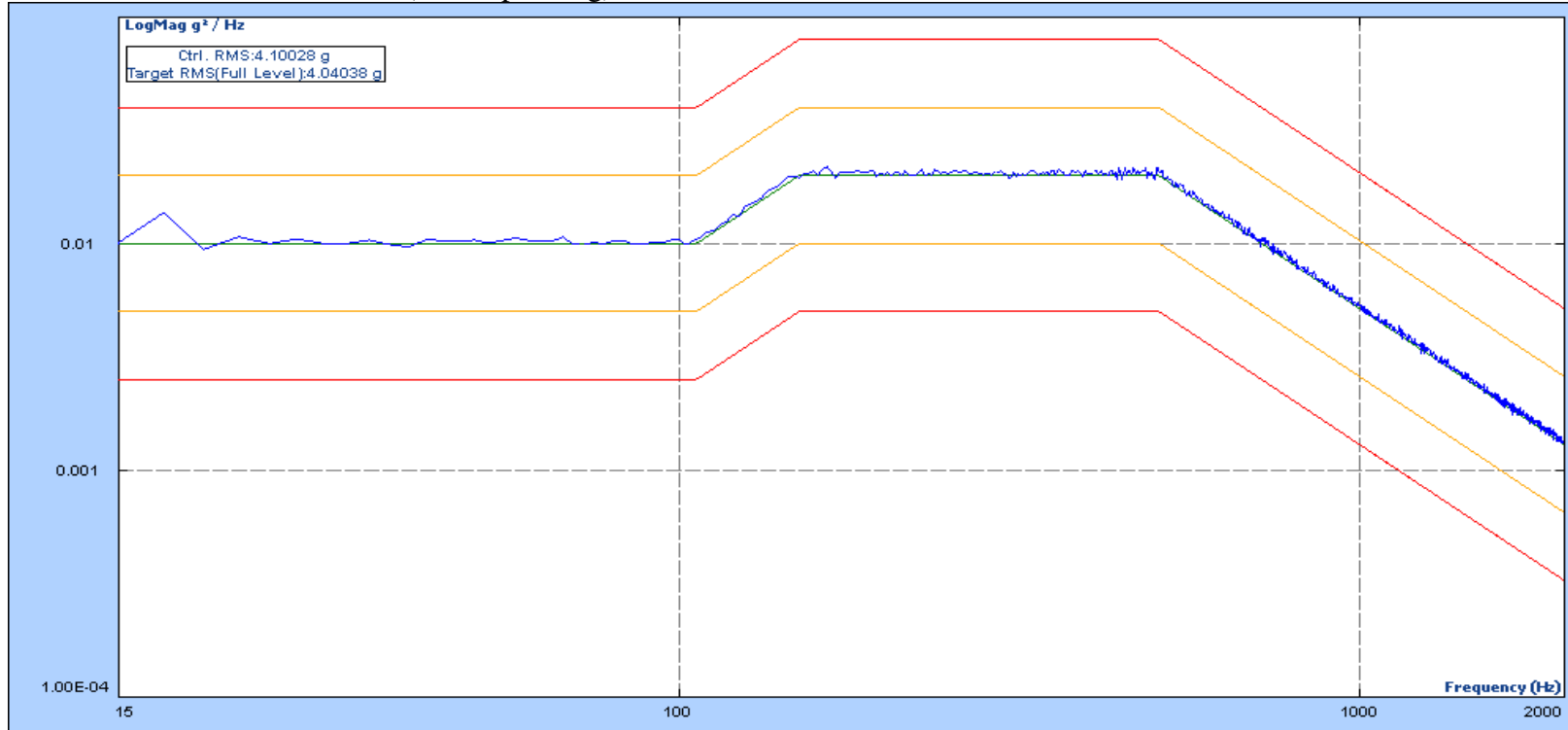
TESTING / INSPECTION REPORT



TESTING / INSPECTION REPORT

Shock testing photos (Operating)	
+X axis	-X axis
	
+Y axis	-Y axis
	
+Z axis	-Z axis
	

X axis_Random Vibration Test (Non-Operating)



Level: 100.00 %

Velocity Pk: 134.7 mm/s

Remaining: 00:00:00

Drive Pk: 1.050V

Control RMS: 4.100 g

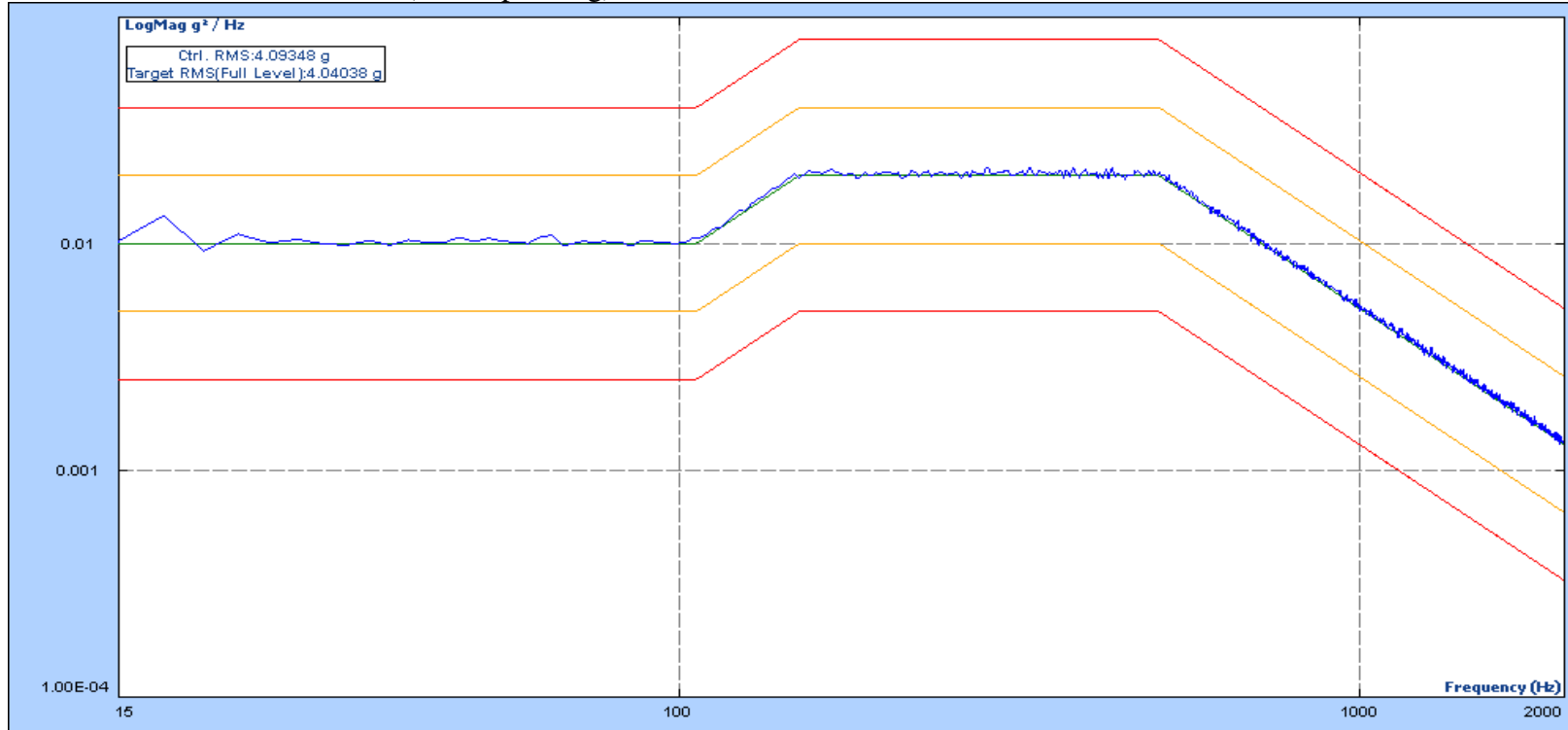
Total Elapsed: 01:00:52

Est. Disp. : 1.757 mm Pk-Pk

Target RMS: 4.035 g

Full Level Elapsed: 01:00:00

Y axis_Random Vibration Test (Non-Operating)

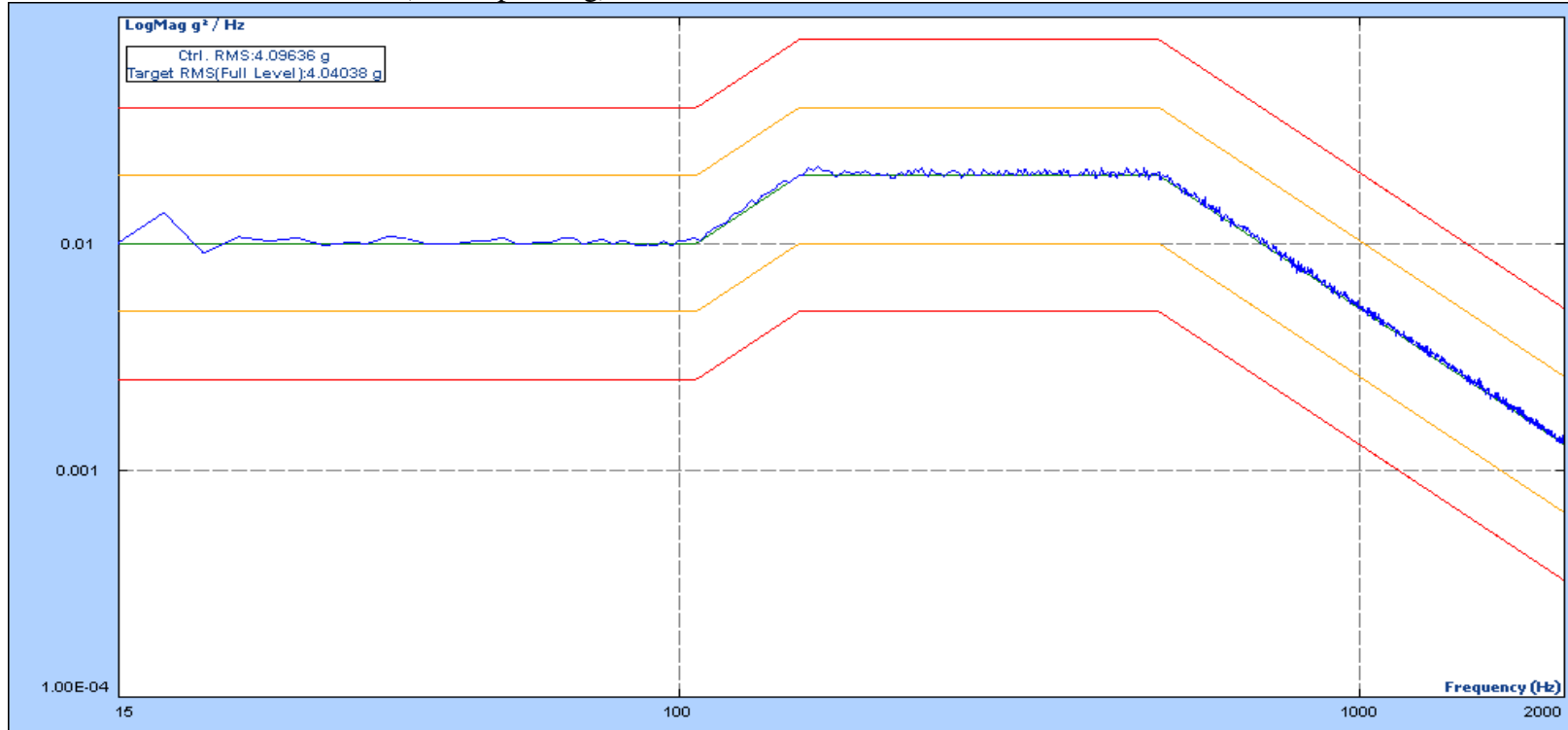


Level: 100.00 %
 Velocity Pk: 134.7 mm/s
 Remaining: 00:00:00

Drive Pk: 1.068V
 Control RMS: 4.093 g
 Total Elapsed: 01:00:52

Est. Disp. : 1.759 mm Pk-Pk
 Target RMS: 4.035 g
 Full Level Elapsed: 01:00:00

Z axis_Random Vibration Test (Non-Operating)



Level: 100.00 %

Velocity Pk: 134.8 mm/s

Remaining: 00:00:00

Drive Pk: 0.957V

Control RMS: 4.096 g

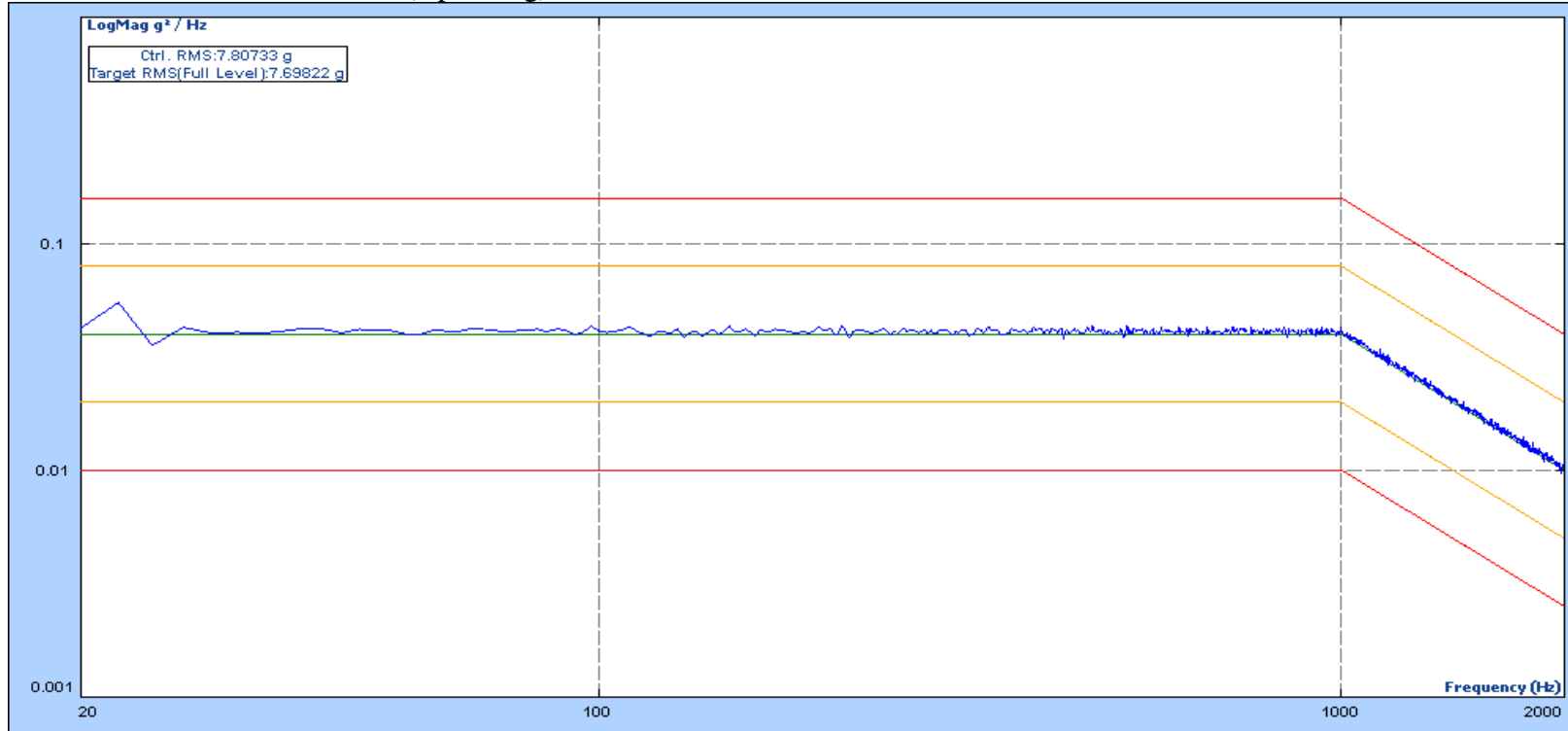
Total Elapsed: 01:00:52

Est. Disp. : 1.760 mm Pk-Pk

Target RMS: 4.035 g

Full Level Elapsed: 01:00:00

X axis_Random Vibration Test (Operating)

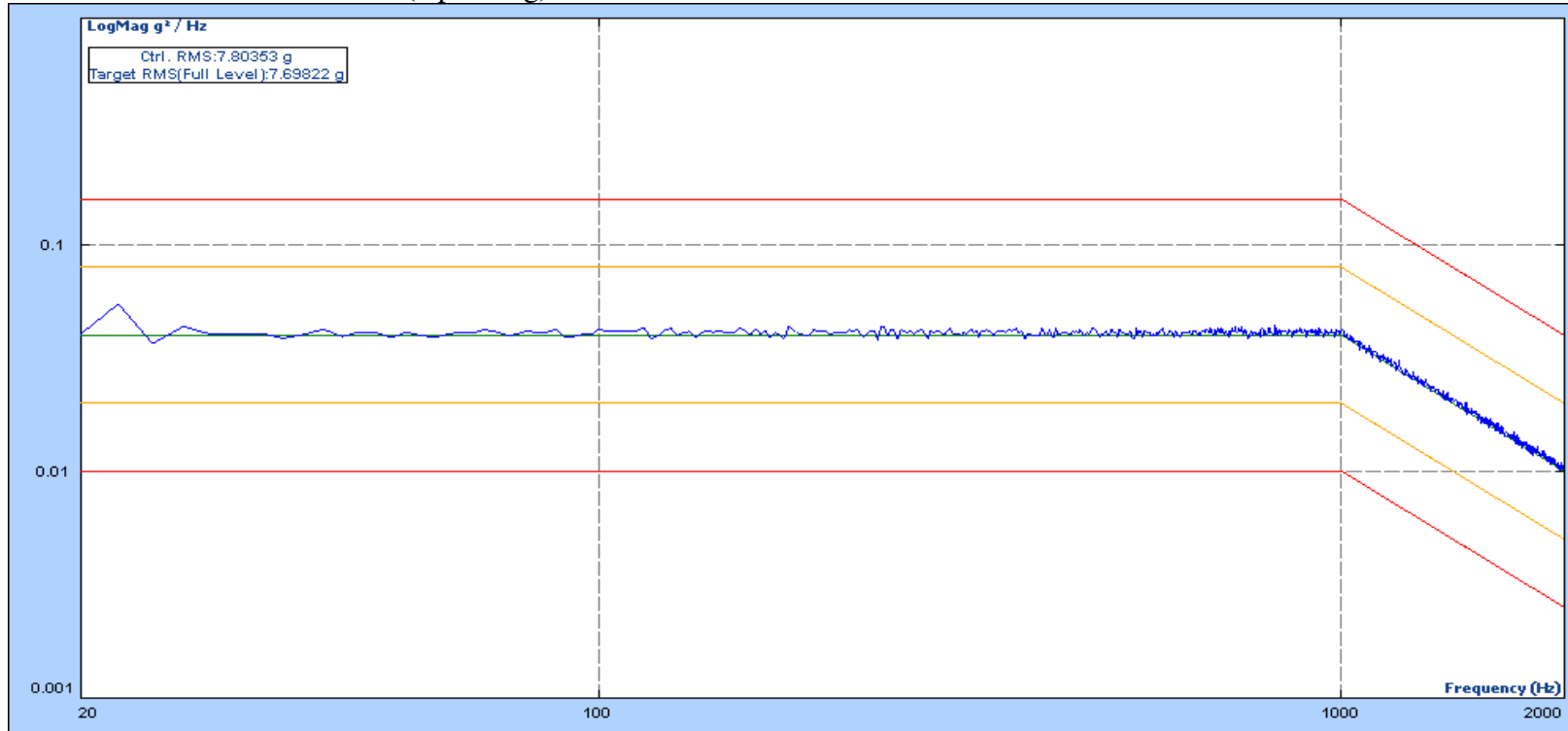


Level: 100.00 %
 Velocity Pk: 0.221 m/s
 Remaining: 00:00:00

Drive Pk: 2.342V
 Control RMS: 7.807 g
 Total Elapsed: 01:00:54

Est. Disp. : 2.213 mm Pk-Pk
 Target RMS: 7.697 g
 Full Level Elapsed: 01:00:00

Y axis_Random Vibration Test (Operating)



Level: 100.00 %

Velocity Pk: 0.220 m/s

Remaining: 00:00:00

Drive Pk: 2.135V

Control RMS: 7.804 g

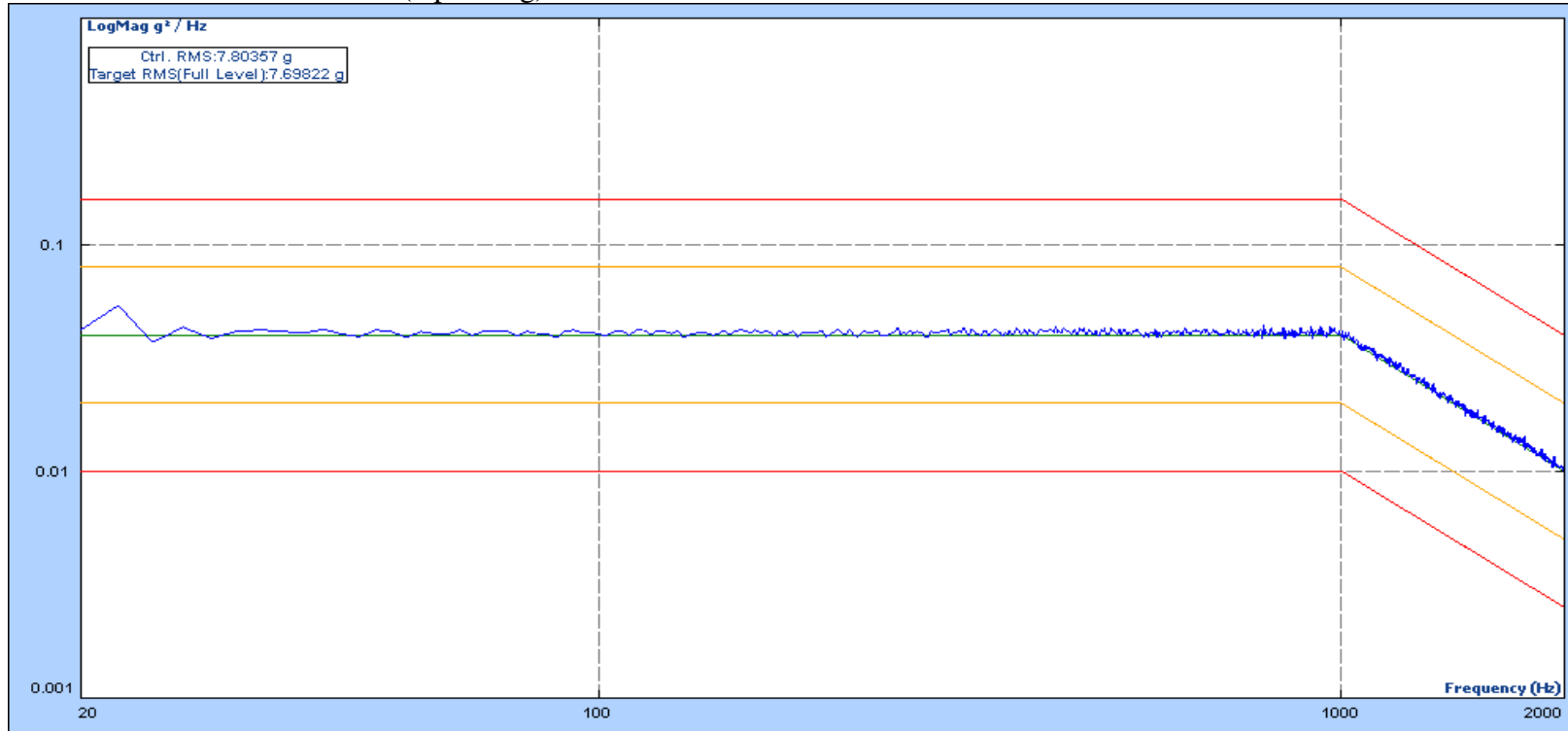
Total Elapsed: 01:00:54

Est. Disp. : 2.197 mm Pk-Pk

Target RMS: 7.697 g

Full Level Elapsed: 01:00:00

Z axis_Random Vibration Test (Operating)



Level: 100.00 %
 Velocity Pk: 0.221 m/s
 Remaining: 00:00:00

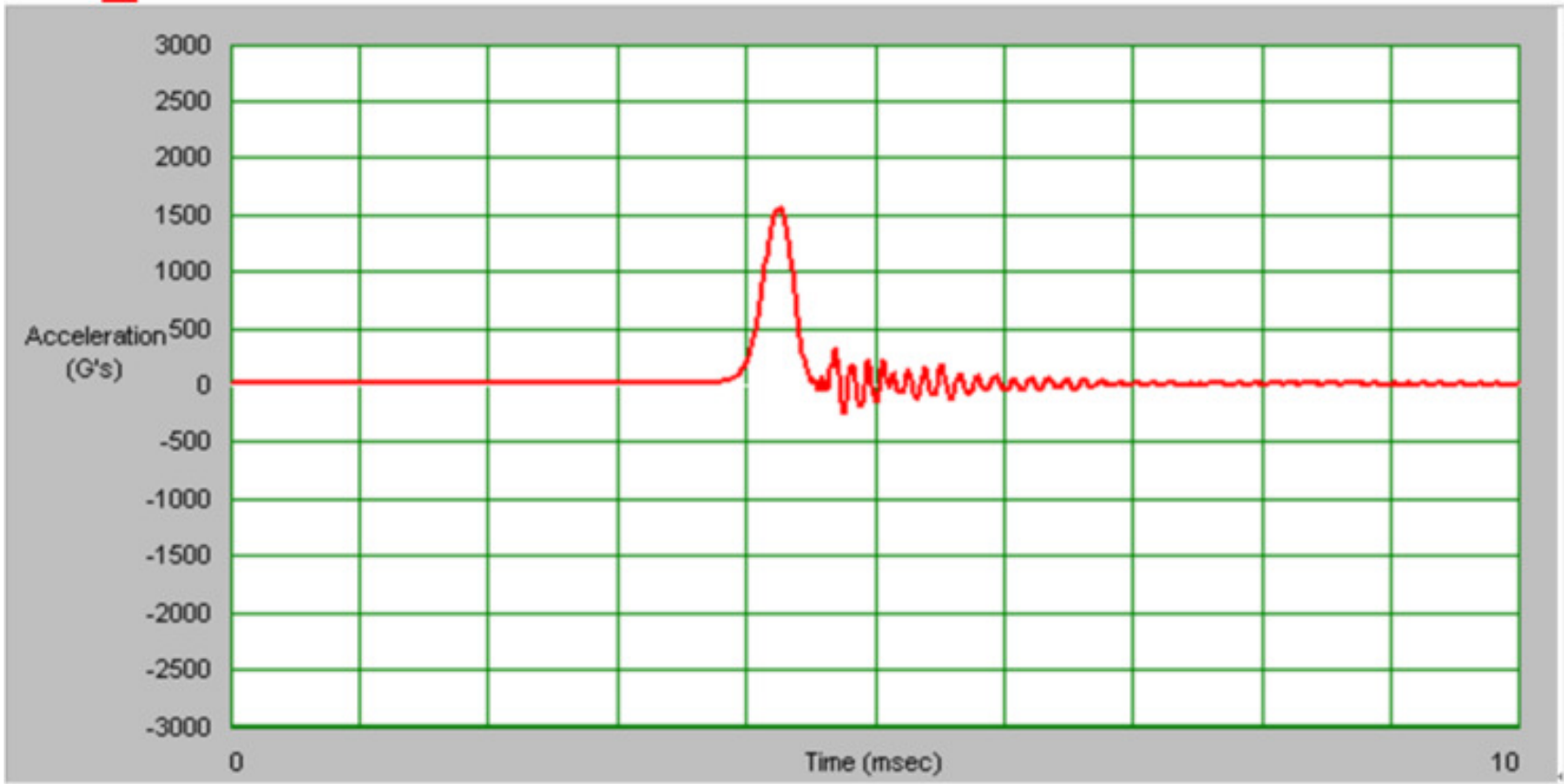
Drive Pk: 1.928V
 Control RMS: 7.804 g
 Total Elapsed: 01:00:54

Est. Disp. : 2.210 mm Pk-Pk
 Target RMS: 7.697 g
 Full Level Elapsed: 01:00:00

+X axis_1,500g 0.5ms (Non-Operating)

Acceleration vs Time

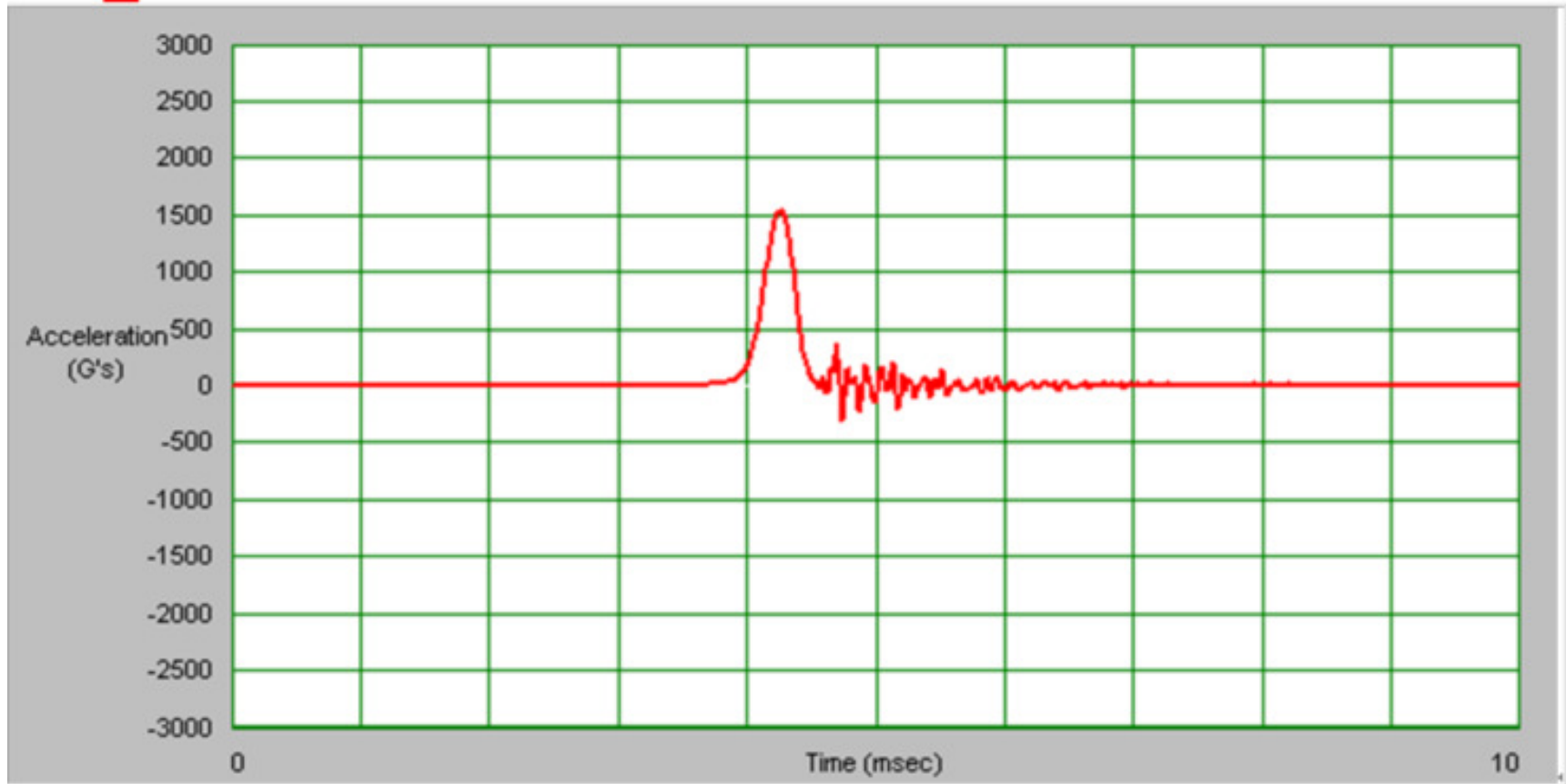
Channel Description:	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1556.08	0.50	4.41	5000.00	1556.08	-241.59



-X axis_1,500g 0.5ms (Non-Operating)

Acceleration vs Time

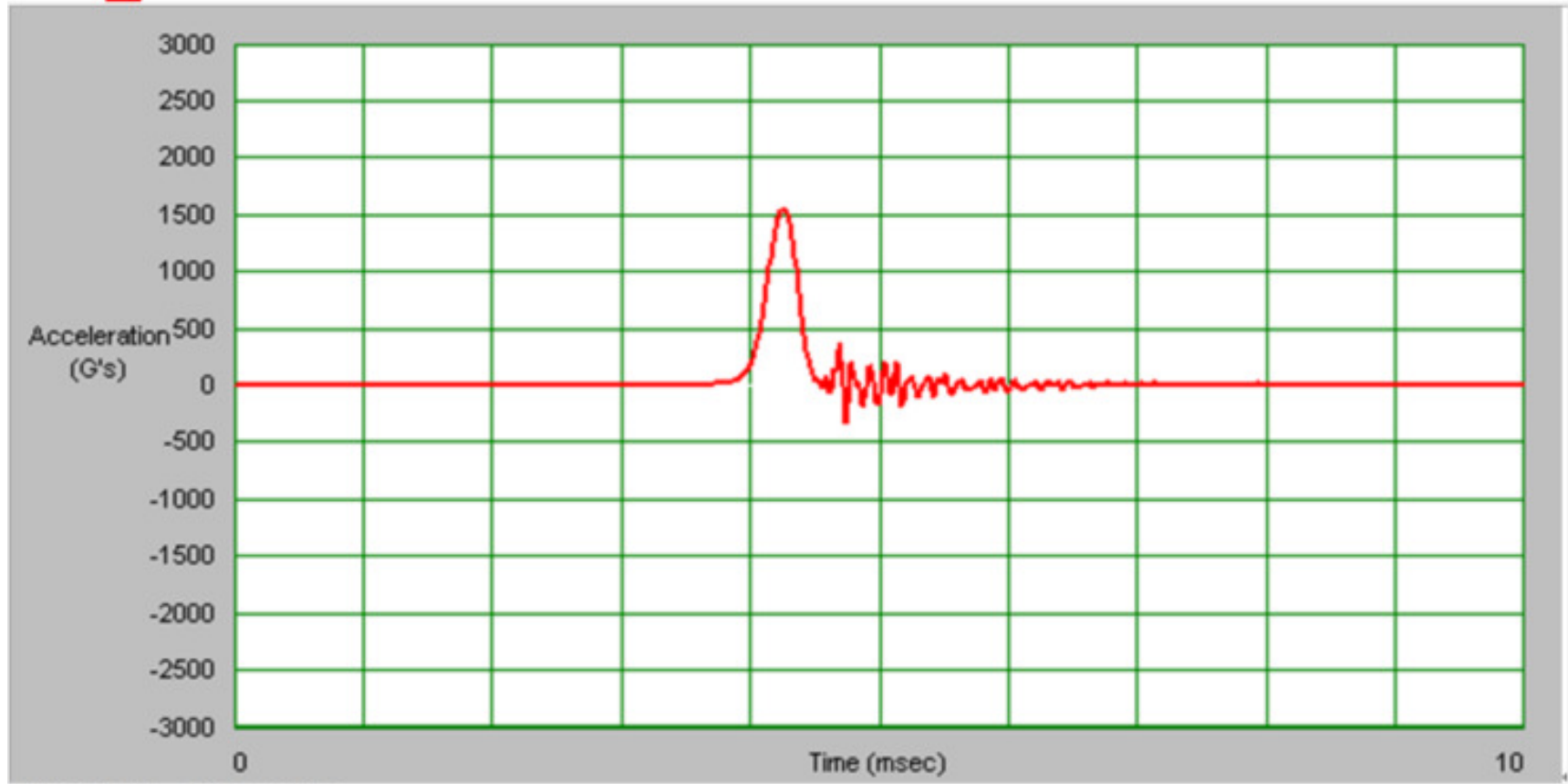
Channel Description:	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1538.60	0.50	4.35	5000.00	1538.60	-307.79



+Y axis_1,500g 0.5ms (Non-Operating)

Acceleration vs Time

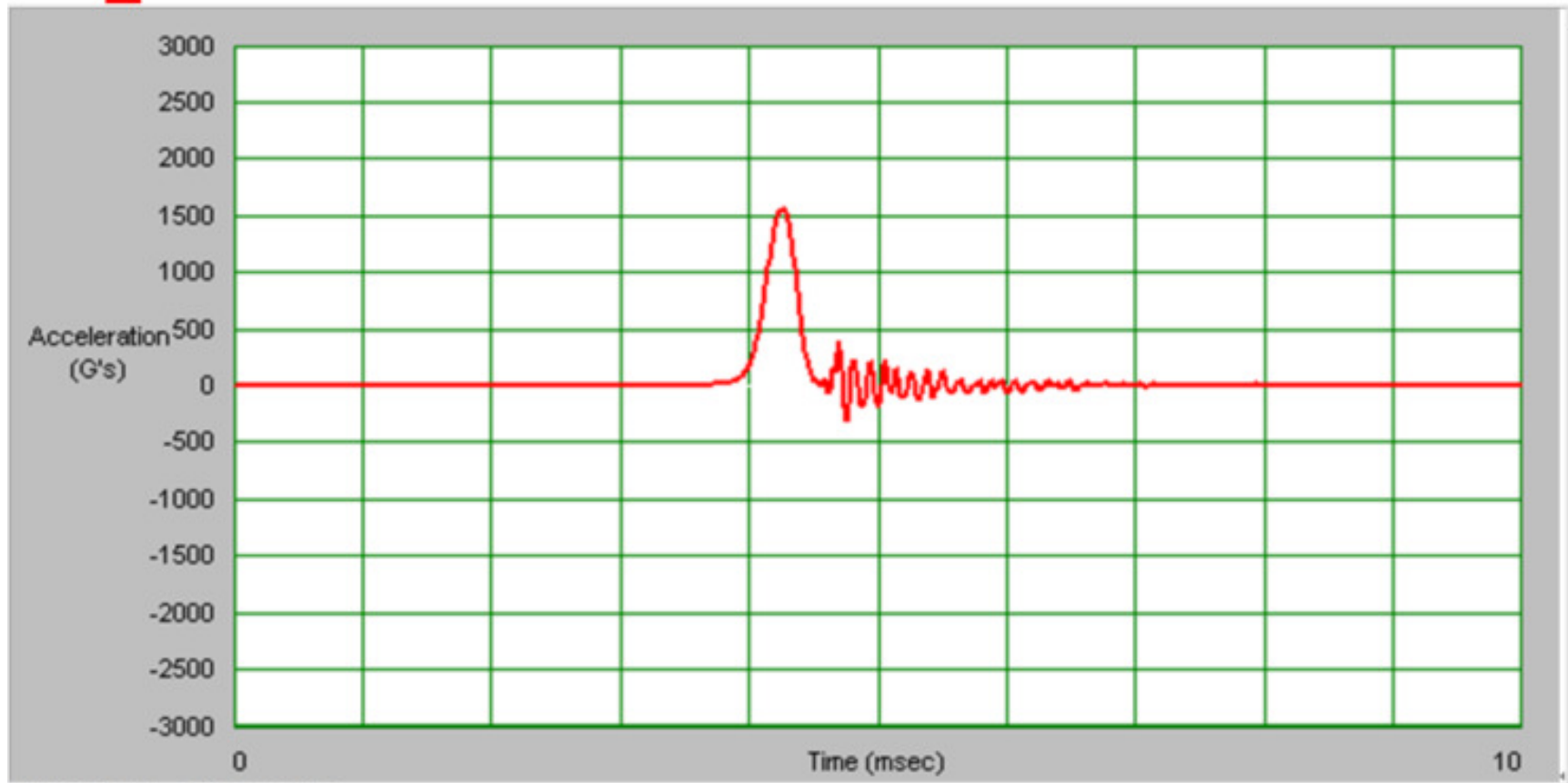
Channel Description:	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1541.20	0.50	4.35	5000.00	1541.20	-324.32



-Y axis_1,500g 0.5ms (Non-Operating)

Acceleration vs Time

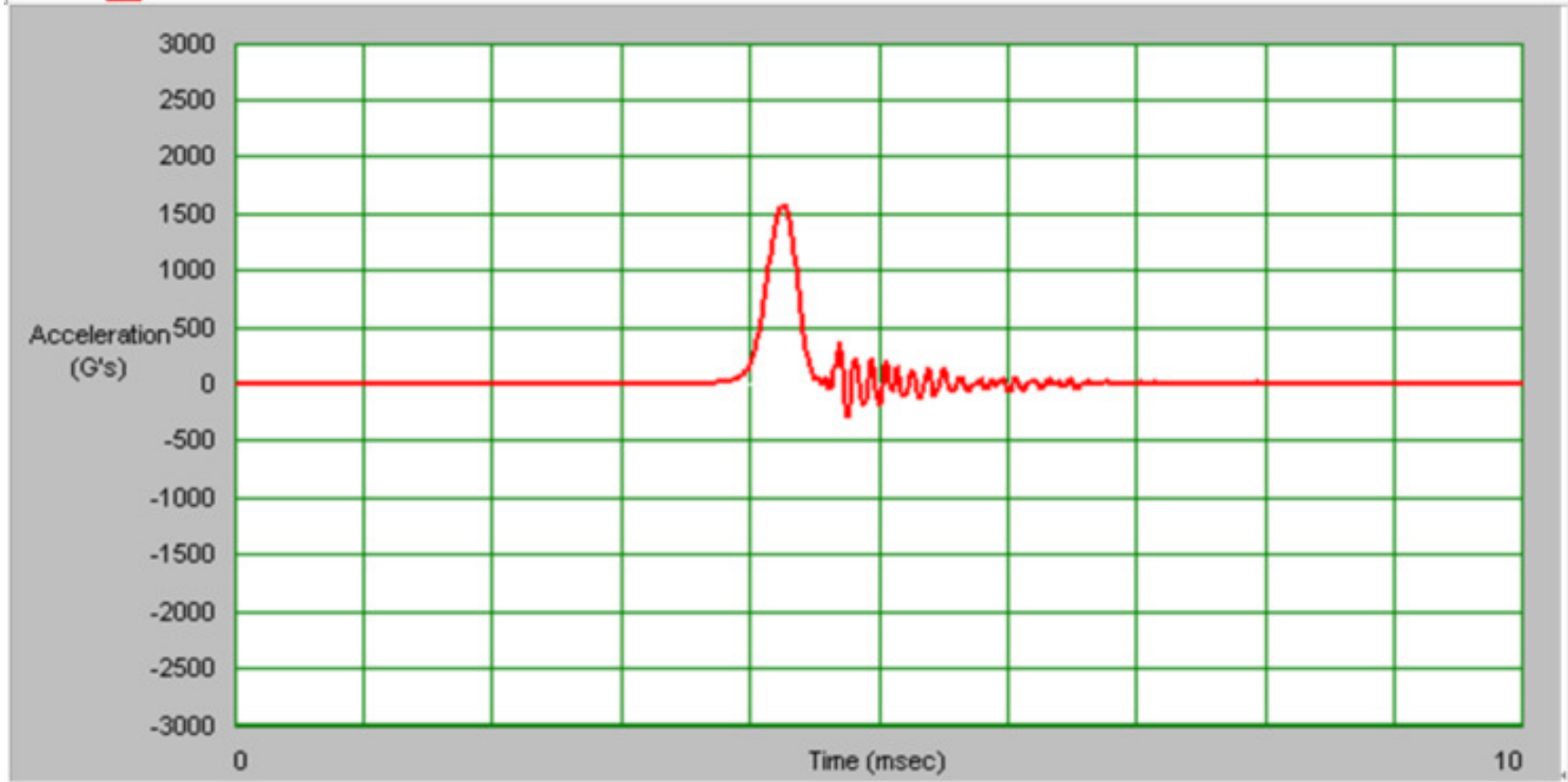
Channel Description:	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1555.59	0.49	4.36	5000.00	1555.59	-311.20



+Z axis_1,500g 0.5ms (Non-Operating)

Acceleration vs Time

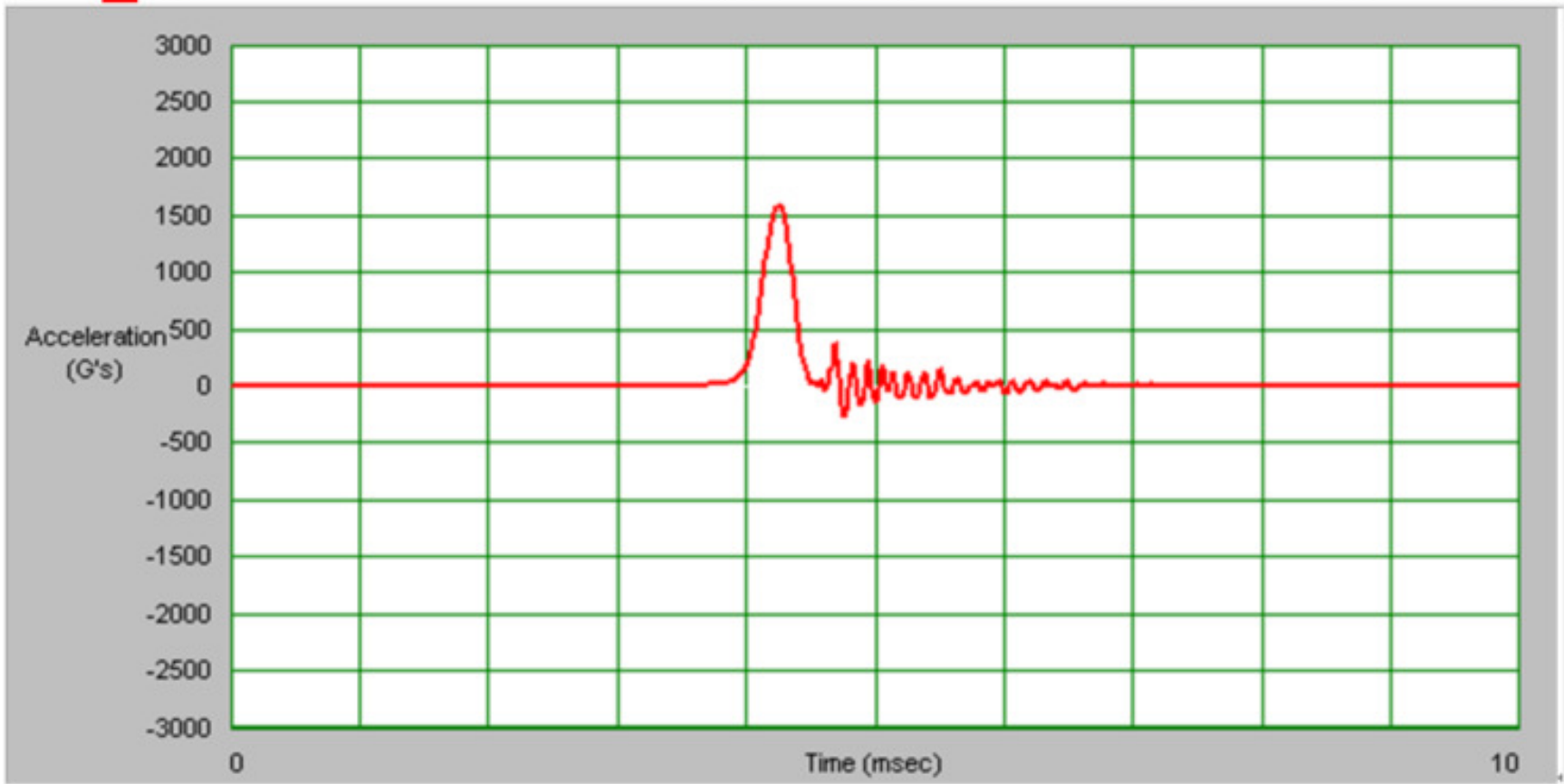
Channel Description	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1563.52	0.49	4.38	5000.00	1563.52	-285.99



-Z axis_1,500g 0.5ms (Non-Operating)

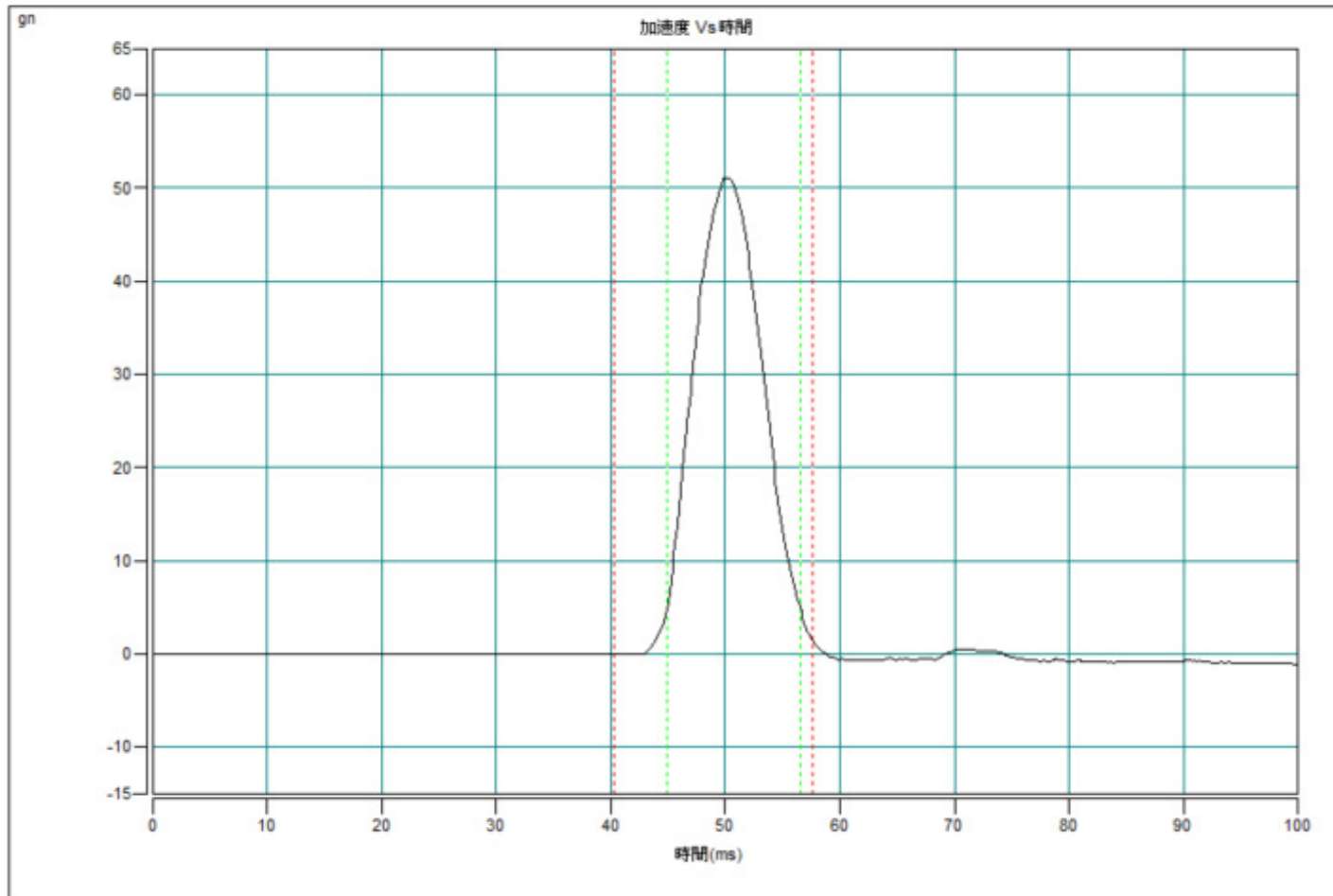
Acceleration vs Time

Channel Description	G's	msec	m/s	Filter Hz	Max G's	Min G's
Ch1 Table	1577.88	0.49	4.37	5000.00	1577.88	-267.04



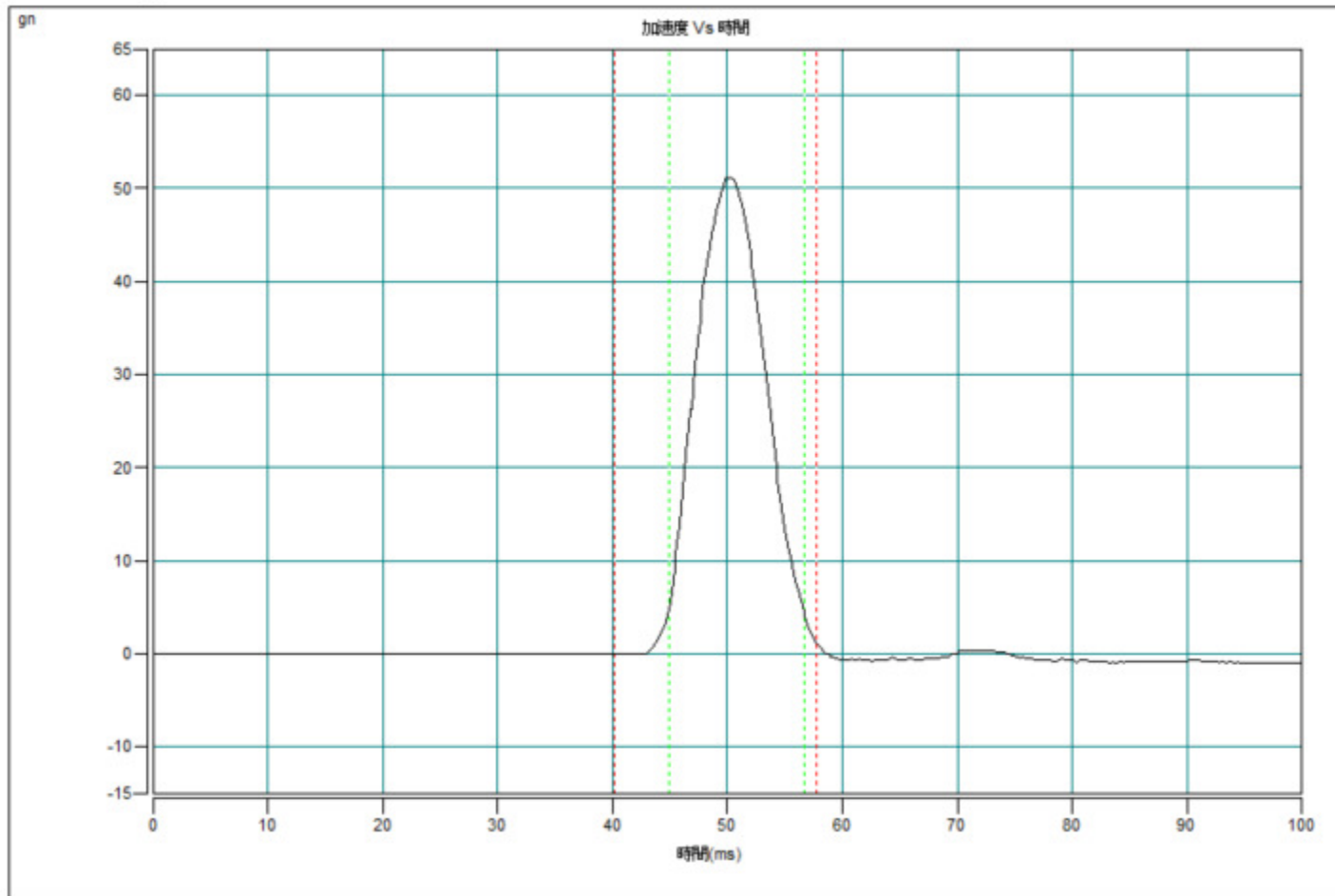
+X axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1(t)	51.11	11.54	3.56	500.00	51.11	-1.08



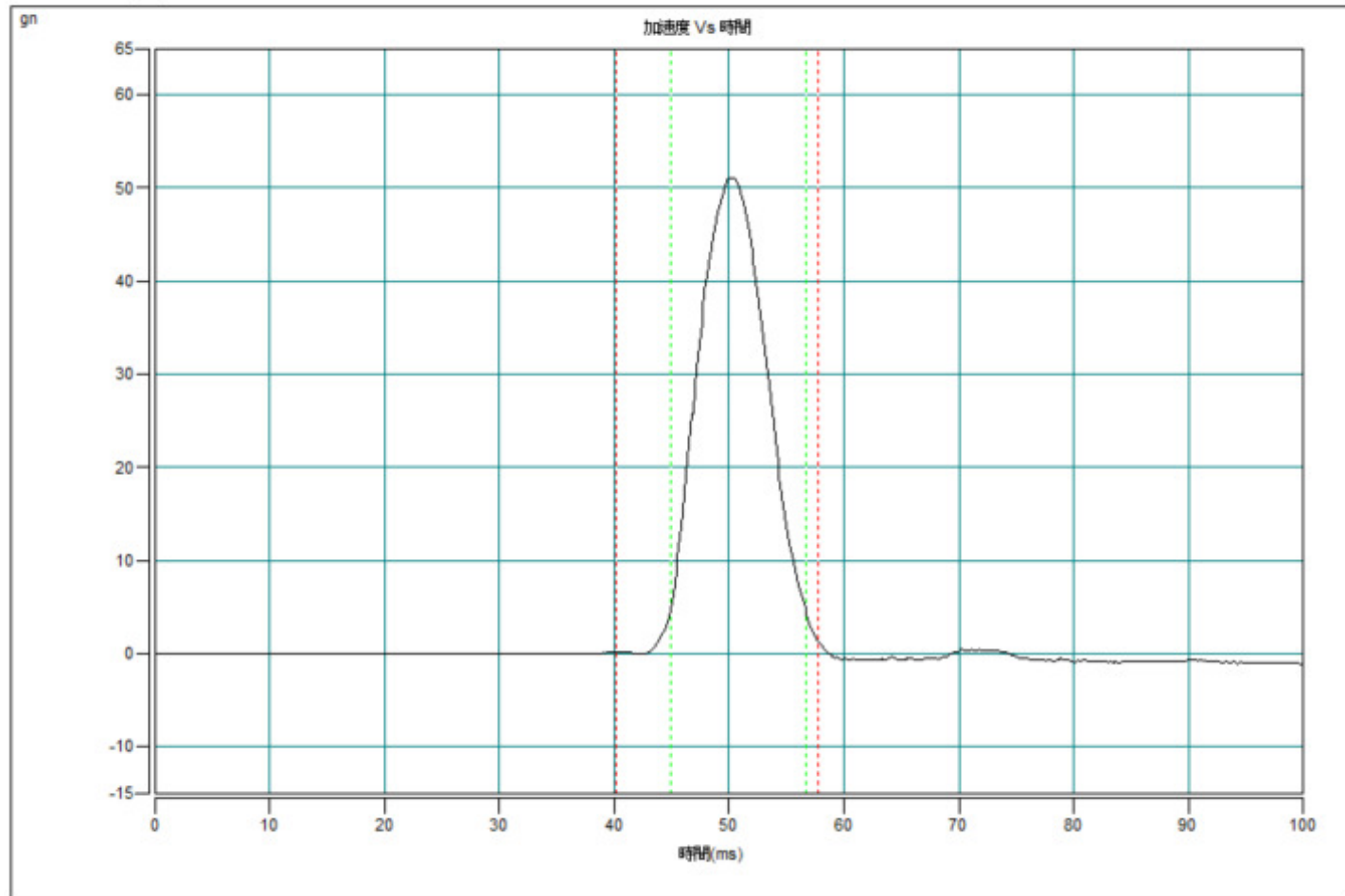
-X axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1 (t)	51.24	11.58	3.57	500.00	51.24	-1.04



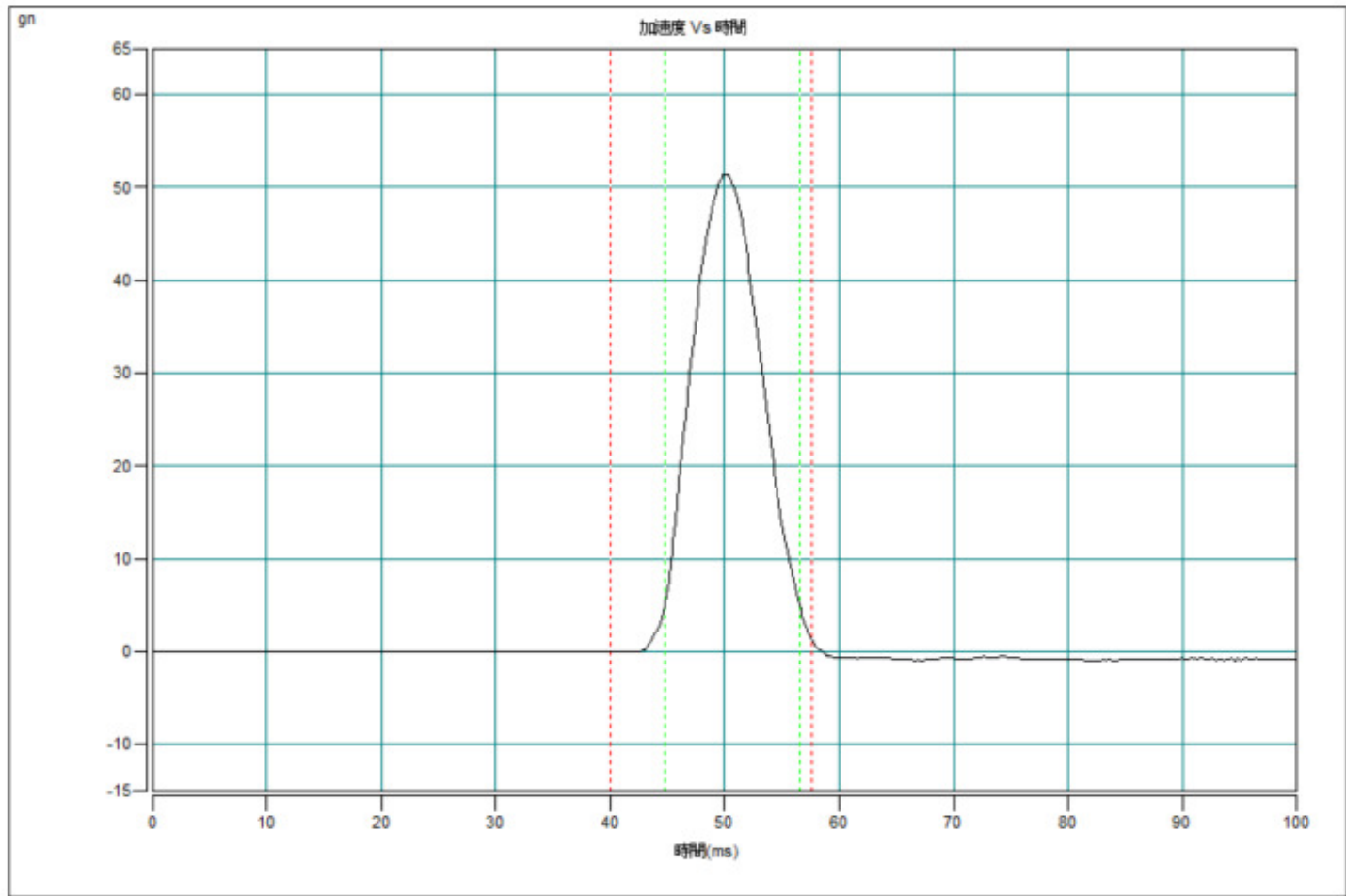
+Y axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1 (t)	51.10	11.61	3.57	500.00	51.10	-1.08



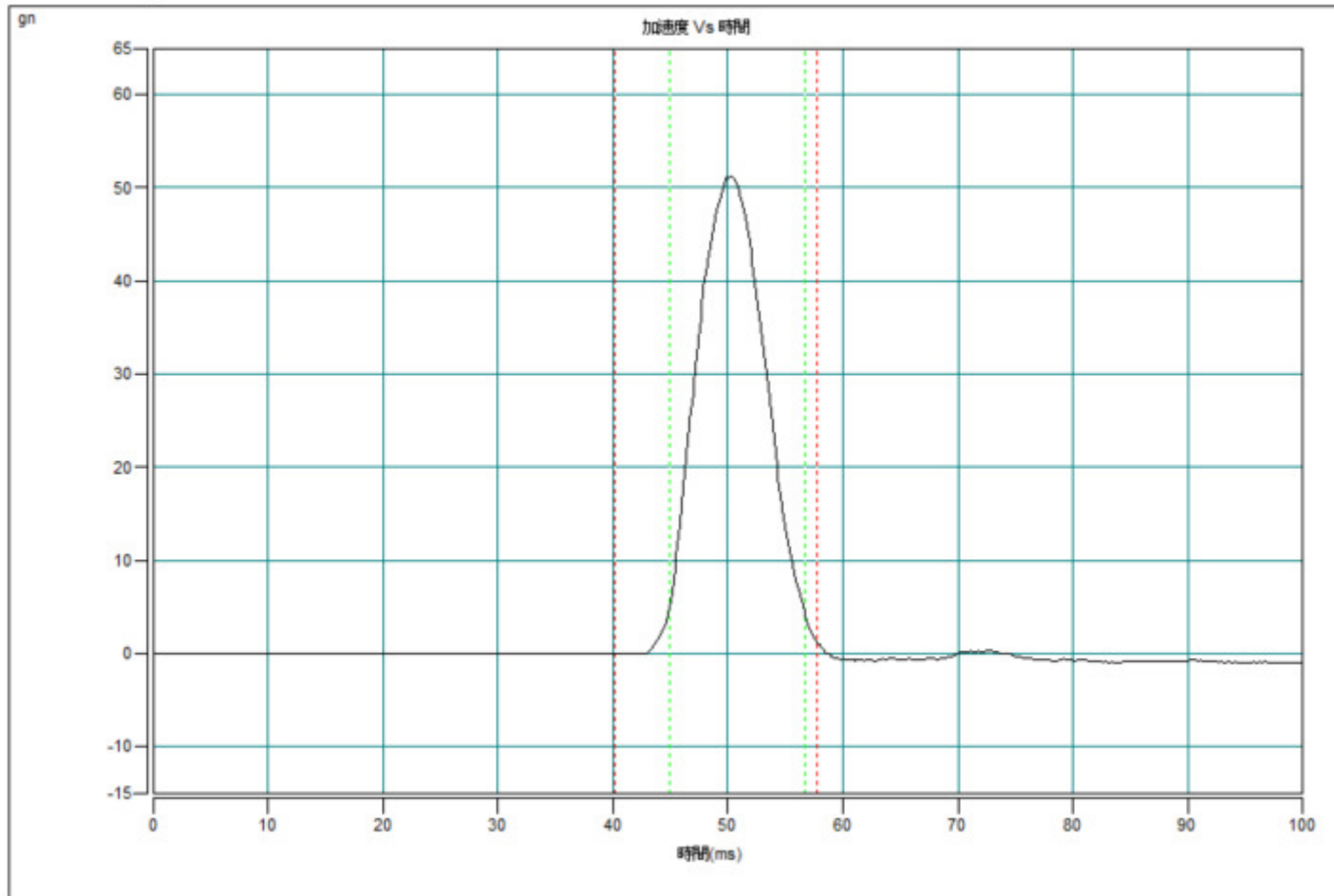
-Y axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1 (t)	51.40	11.73	3.64	500.00	51.40	-1.02



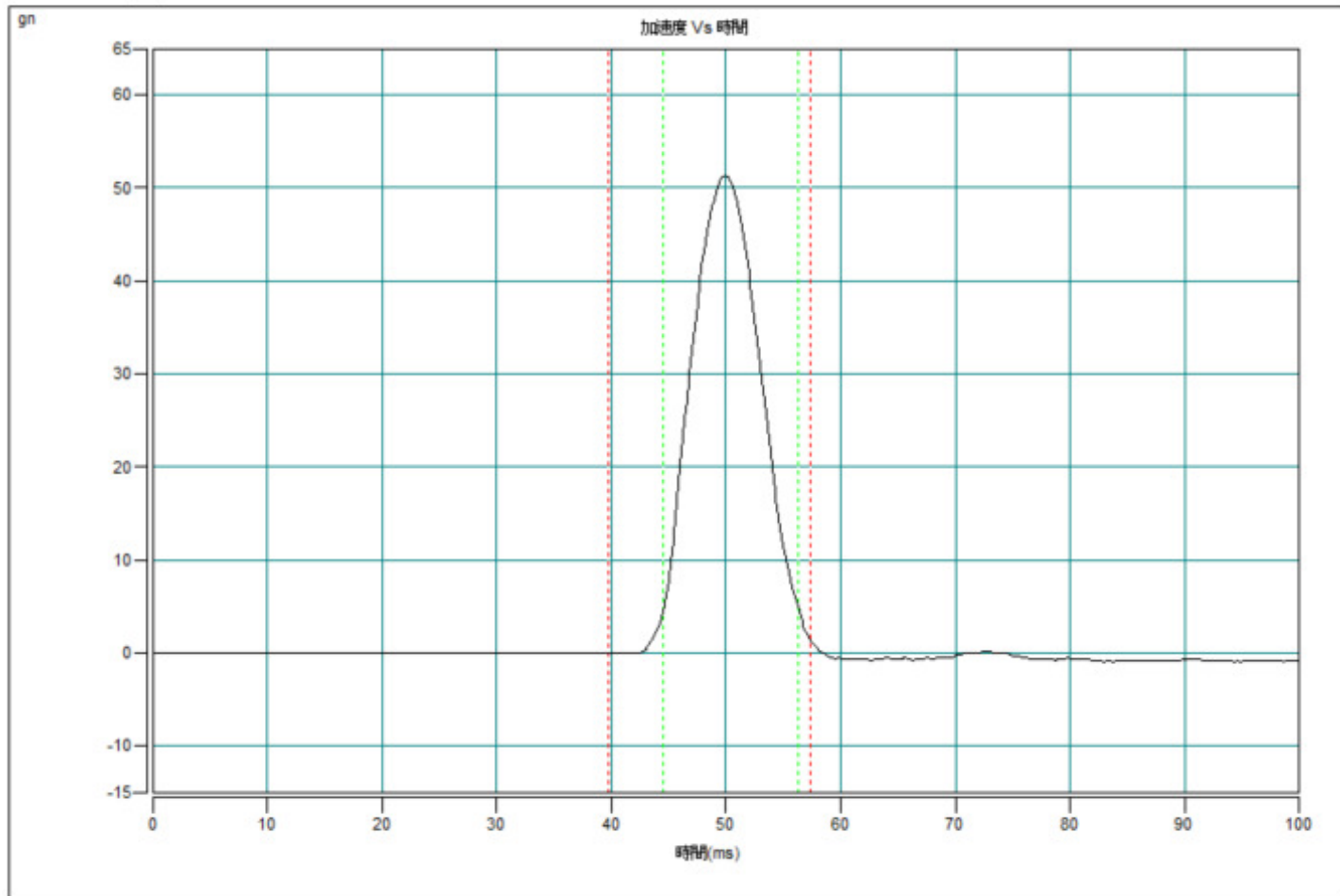
+Z axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1 (t)	51.20	11.62	3.58	500.00	51.20	-1.02



-Z axis_50g 11ms (Operating)

訊號名稱	加速度 (gn)	作動時間 (ms)	速度變化率 (m/s)	低通濾波 (Hz)	最大加速度	最小加速度
Input1 (t)	51.32	11.62	3.59	500.00	51.32	-0.98



-END-