

TEST REPORT



CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (1) / (25) pages

1. Applicant

- Name : Hanwha Vision Co., Ltd
- Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488 KOREA
- Date of Receipt : Jul. 04, 2025

2. Manufacturer

- Name : Hanwha Vision Co., Ltd

3. Use of Report :

For submission to customer

4. Test sample / Model :

NETWORK CAMERA / TNP-A9430RW

5. Date(s) of test :

Aug. 18, 2025 ~ Jul. 26, 2025

6. Test Standard (Method) used :

NEMA TS 2-2013 2.2.7.3 Test C ~ 2.2.7.8 Test H,
NEMA TS 2.1.9, NEMA TS 2.1.10

7. Testing Environment :

Temperature: (25 ±10) °C, Humidity: (50 ±25) % R.H.
Pressure: (96 ±10) kPa

8. Test Results :

Refer to the test results

9. Location of Test :

☒ Permanent Testing Lab ☐ On Site Testing
(5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This report cannot be reproduced or copied without the written consent of CTK.

Approval	Tested by	Technical Manager
	Name: HyungUk Jeon (Signature)	Name: HoHyun Lee (Signature)

Remark. This report is not related to KOLAS accreditation and relevant regulation.

Sep. 04, 2025

CTK Co., Ltd.



**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (2) / (25) pages

Table of Contents

1. Testing laboratory	3
1.1 Testing laboratory information	3
1.2 Testing laboratory accreditation status	3
2. Product description and equipment information	4
2.1 Product description	4
2.2 Equipment information	4
2.3 Pre-test product images	5
2.4 Testing equipment images	7
3. NEMA TS 2-2013 2.2.7.3 Test C ~ 2.2.7.8 Test H	8
3.1 Test date and environmental conditions	8
3.2 Test conditions and methods	8
3.3 Testing images	9
3.4 Test Result	10
3.5 Test Data	11
3.6 Test sample operation images	12
4. Resonant search, Endurance Test [NEMA TS 2-2013 2.1.9]	13
4.1 Test date and environmental conditions	13
4.2 Test conditions and methods	13
4.3 Testing images	14
4.4 Test Result	15
4.5 Test Data	16
5. Shock(impact) Test [NEMA TS 2-2013 2.1.10]	19
5.1 Test date and environmental conditions	19
5.2 Test conditions and methods	19
5.3 Testing images	20
5.4 Test Result	21
5.5 Test Data	22
5.6 Post-test product images	25

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (3) / (25) pages

1. Testing laboratory

1.1 Testing laboratory information

Lab. Name	CTK Co., Ltd.
Representative	Young Joseph Seungwon
Address	5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Tel.	+82-31-339-9970
Fax.	+82-31-624-9501
E-Mail	all.youngin@element.com
Website	www.elementkorea.kr

1.2 Testing laboratory accreditation status

Country	Classification	Accreditation Number	Logo
International	KOLAS	TESTING NO. KT119	

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (4) / (25) pages

2. Product description and equipment information

2.1 Product description

Product Name	Model Name	Quantity	Comment
NETWORK CAMERA	TNP-A9430RW	1 EA	–

2.2 Model description

Basic Model	TNP-A9430RW
Series model	TNP-A9430RWB
Model differences	Use of the same external shape and materials (case, finishing material, PCB, cable, etc.), differences in SW.

2.3 Equipment information

Testing equipment	Model Name	Manufacturer	Manufacturing Number	Calibration Date
Temperature & Humidity Chamber	ARS-1100-AE	ESPEC	1110024015	Oct 07, 2025
VIBRATION TESTING SYSTEM	LT1010	FAMTECH	D2012335	N/A
Acceleration sensor	8703A250M5	KISTLER	5830236	Jan. 16, 2026
Acceleration sensor	8703A250M5	KISTLER	5722241	Jan. 16, 2026

2.4 Pre-test product images

2.4.1 Test sample



Top



Bottom



Front



Rear



Left side



Right side

2.4.2 Test sample



Top



Bottom



Front



Rear



Left side



Right side



CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (7) / (25) pages

2.5 Testing equipment images

2.5.1 Test equipment



Temperature & Humidity Chamber



VIBRATION TESTING SYSTEM



8703A250M5



8703A250M5



CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (8) / (25) pages

3. NEMA TS 2-2013 2.2.7.3 Test C ~ 2.2.7.8 Test H

3.1 Test date and environmental conditions

3.1.1 Test date: Aug. 24, 2025 ~ Aug. 26, 2025

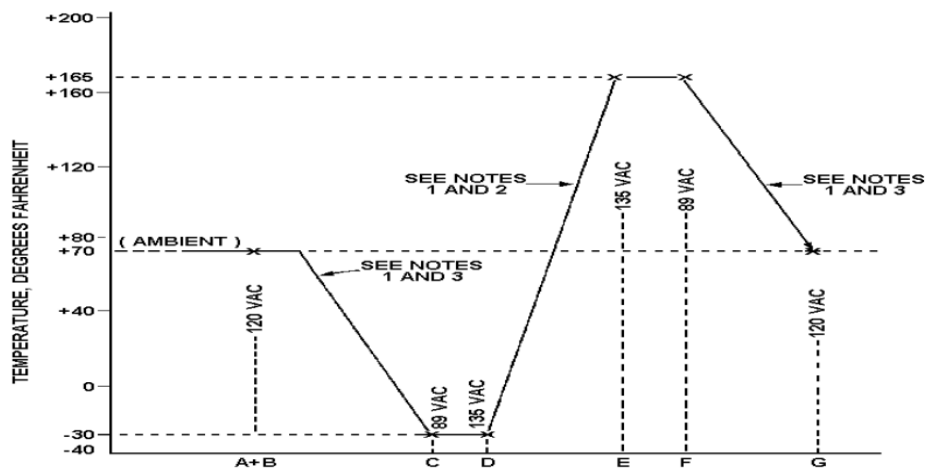
3.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.2	46.2	96.3

3.2 Test conditions and methods

- 3.2.1 2.2.7.3 Test C: - 34 °C, 89 Vac, 10 h (Check interim operation after 5 h and operation check after 10h)
- 3.2.2 2.2.7.4 Test D: - 34 °C, 135 Vac, 1 h (Operating state)
- 3.2.3 2.2.7.5 Test E: 74 °C, 18 %, 135 Vac, 15 h (Operating state)
- 3.2.4 2.2.7.6 Test F: 74 °C, 18 %, 89 Vac (Operation check after 2.2.7.5 Test E)
- 3.2.5 2.2.7.7 Test G: (21 ±6) °C, 120 Vac (Operating state)
- 3.2.6 2.2.7.8 Test H: Check for mechanical damage
- 3.2.7 Test Methods

- Evaluations Criteria :
 - Check for mechanical damage before and after testing
- Test methods



3.3 Testing images

3.3.1 Evidence of test setting



**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (10) / (25) pages

3.4 Test Result

3.4.1 Test result table

Evaluation Criteria		Test Results	Comment
2.2.7.3 Test C ~ 2.2.7.8 Test H	Before	Normal	-
	After	Normal	-



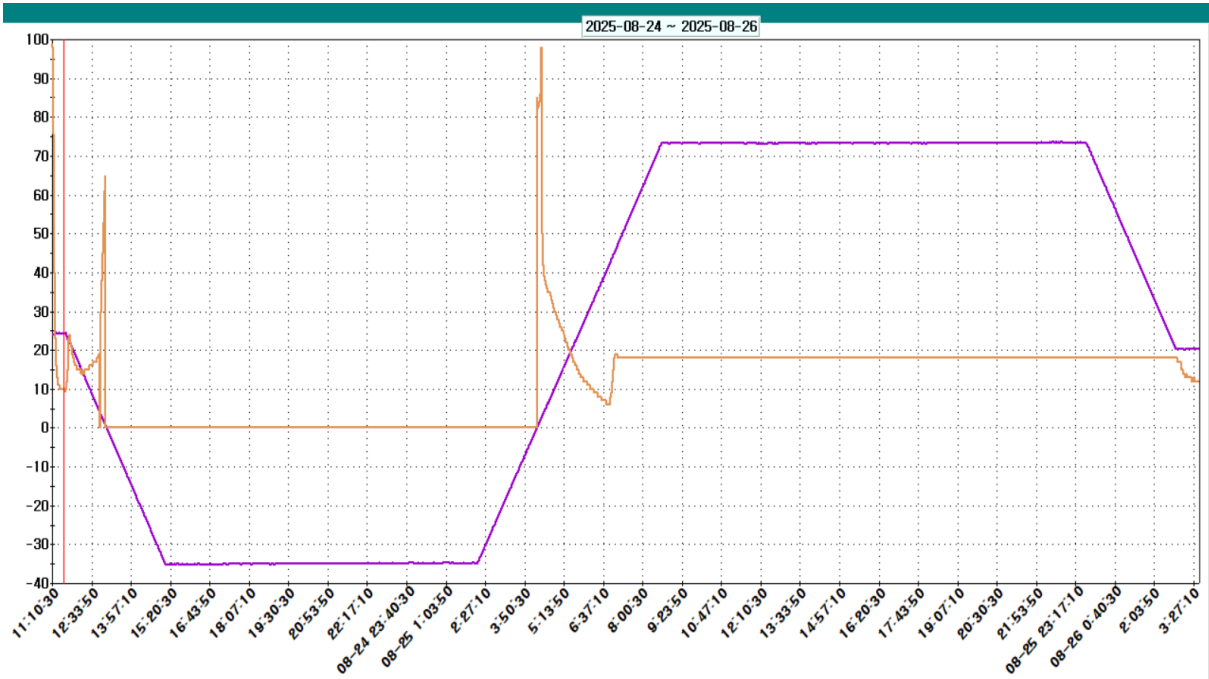
CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (11) / (25) pages

3.5 Test Data

3.5.1 Test data and graph





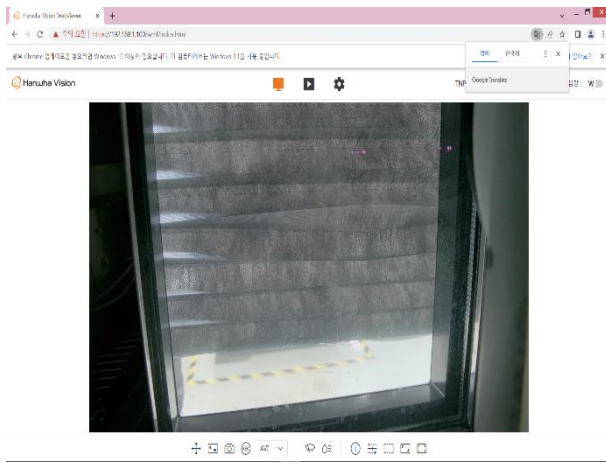
CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

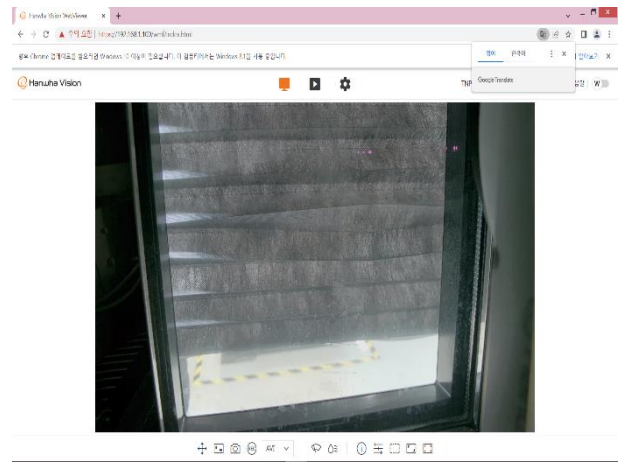
REPORT No.:
CTK-2025-02421
Page (12) / (25) pages

3.6 Test sample operation images

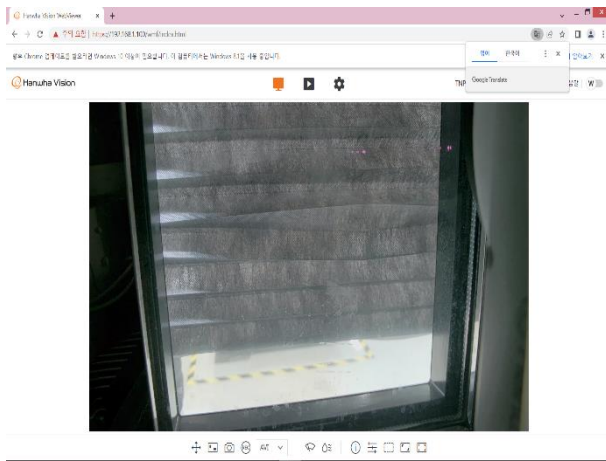
3.6.1 Test sample operation and function



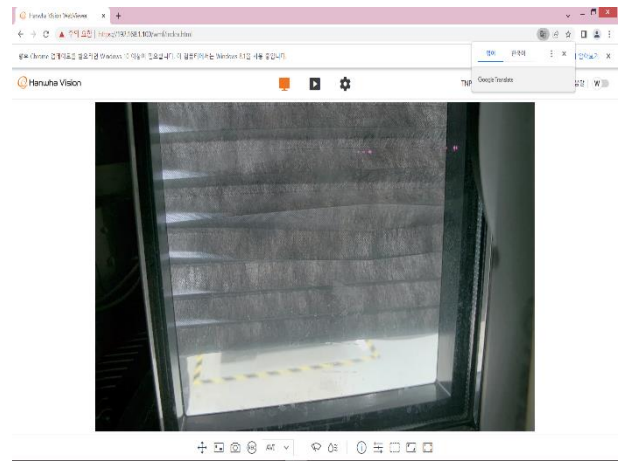
-34 °C 89 Vac



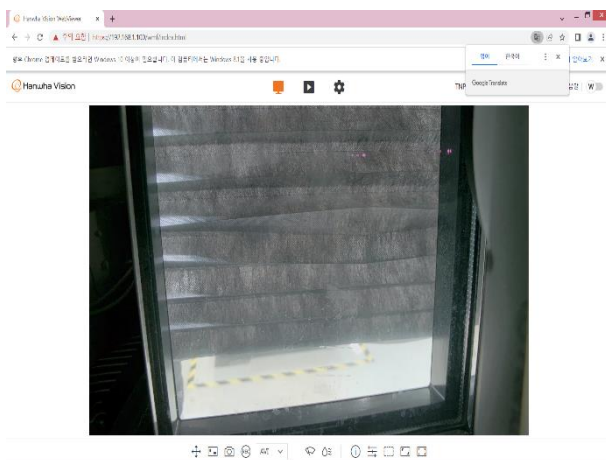
-34 °C 135 Vac



74 °C 135 Vac



74 °C 89 Vac



(21 ±6) °C 120 Vac

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (13) / (25) pages

4. Resonant search, Endurance Test [NEMA TS 2-2013 2.1.9]

4.1 Test date and environmental conditions

4.1.1 Test date: Aug. 18, 2025 ~ Aug. 19, 2025

4.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.7	45.0	89.9

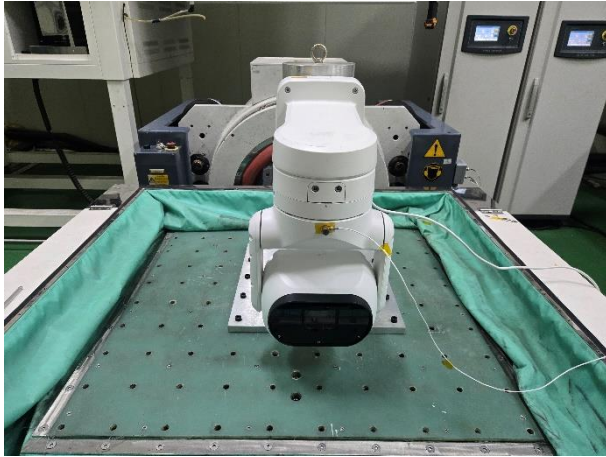
4.2 Test conditions and methods

4.2.1 Resonant search [NEMA TS 2-2013 2.1.9]

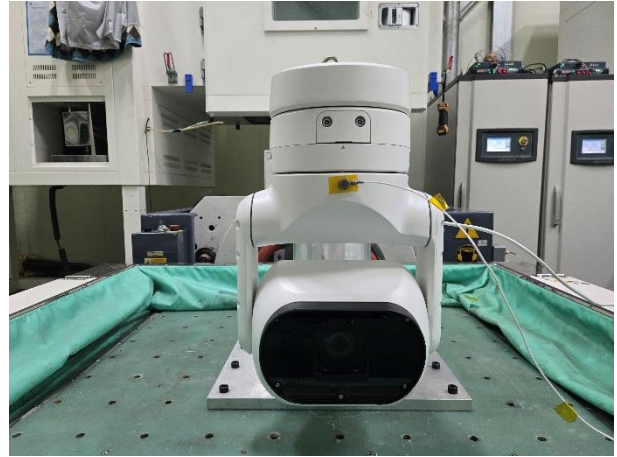
- Sample status : unpackaged / operation
- Applied waveform : Sine
- Frequency(Hz) : 5 ~ 30
- Acceleration(G) : 0.5
- Applicable axis : X, Y, Z
- Test time(h) : All 3(Each axis 1)
- Evaluation items
 - Check for mechanical damage before and after testing
- Test methods
 - The major units of the CA shall maintain all programmed functions and physical integrity when subjected to a vibration of 5 to 30 Hz up to 0.5g's applied in each of three mutually perpendicular planes.

4.3 Testing images

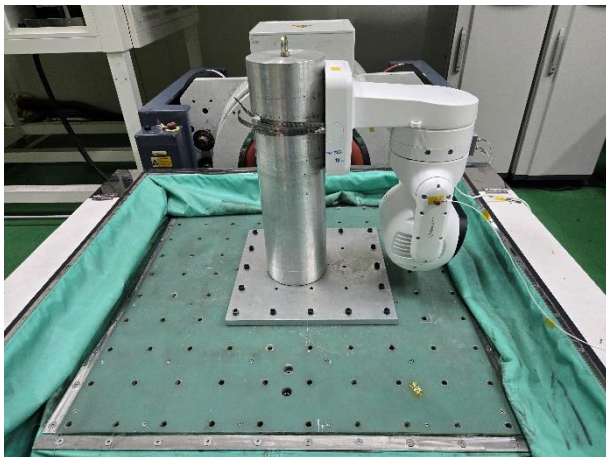
4.3.1 Evidence of test setting (NEMA TS 2-2013 2.1.9)



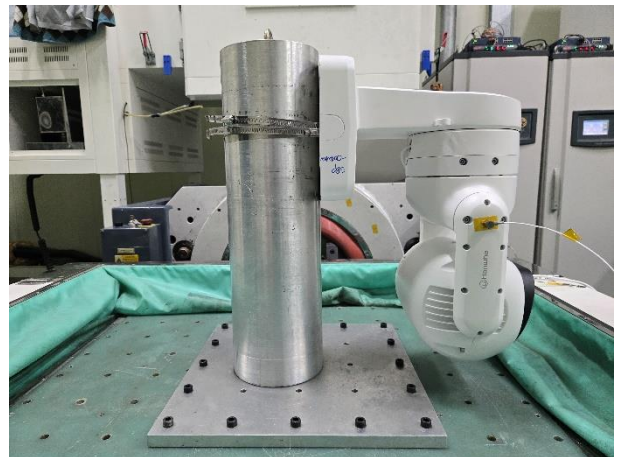
X axis_1



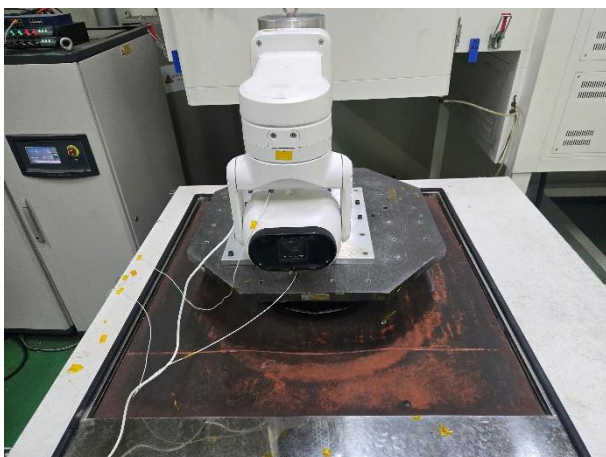
X axis_2



Y axis_1



Y axis_2



Z axis_1



Z axis_2

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (15) / (25) pages

4.4 Test Result

4.4.1 Test result table

Evaluation Criteria		Test Results	Comment
Resonant search Test	Before	Normal	
	After	Normal	
Endurance Test	Before	Normal	
	After	Normal	



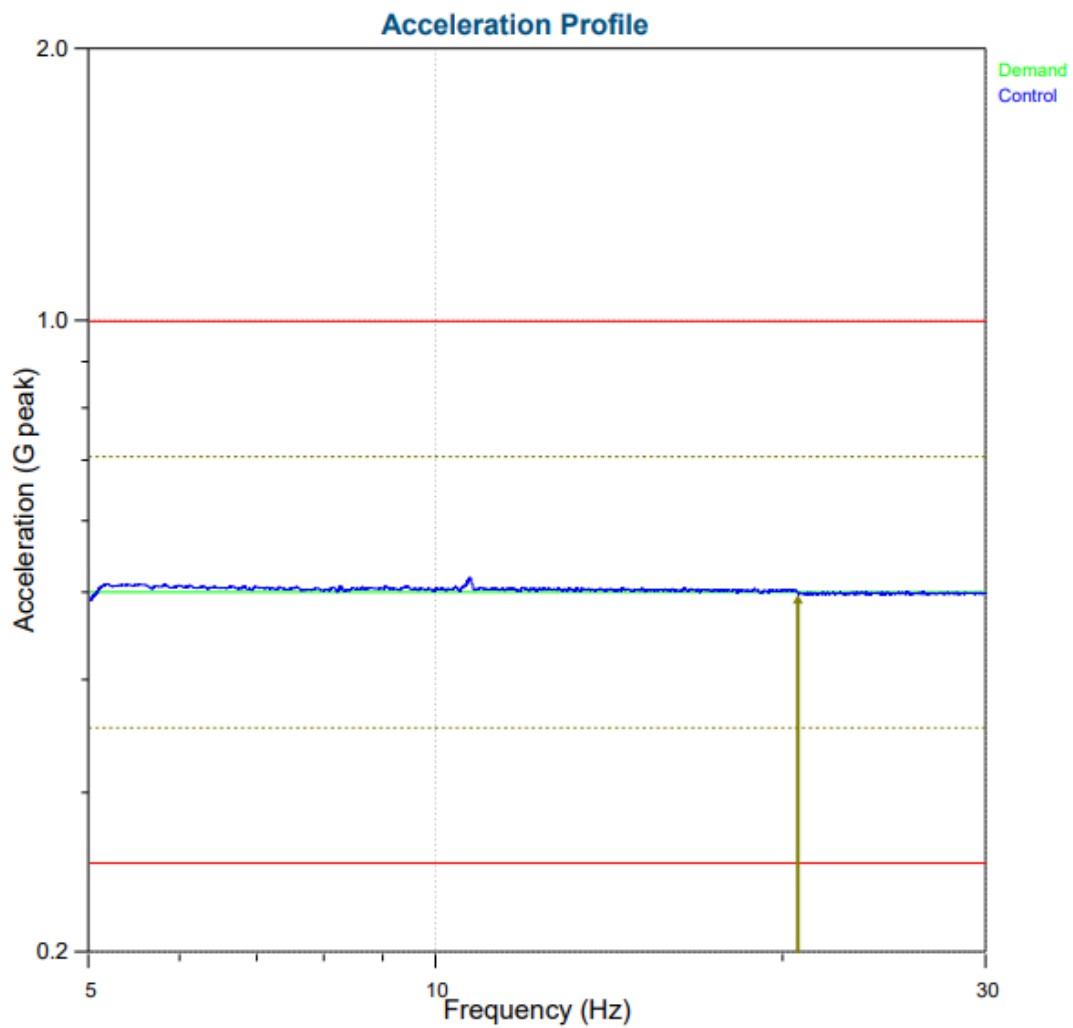
CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (16) / (25) pages

4.5 Test Data

4.5.1 Test Data X Axis



8 18, 2025 16:46:21 Level 1) 100 % Output: 0.07373 Volts peak NEMA-TS 2.1.9 진동

Demand: 0.5 G Level Time: 1:00:00 Frequency: 30 Hz

Control: 0.4969 G Total Time: 1:00:11 End of Timed Test

X axis

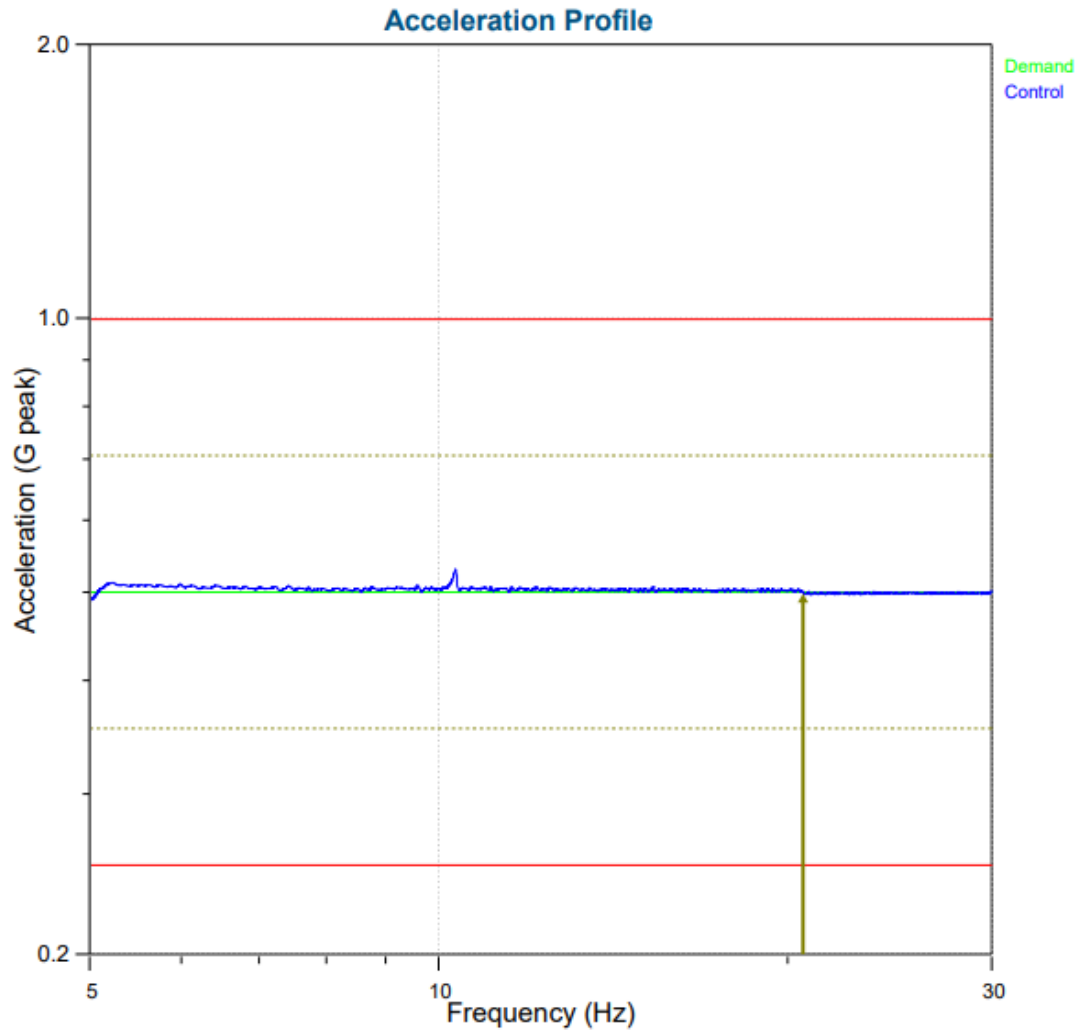


CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (17) / (25) pages

4.5.2 Test Data Y Axis



8 18, 2025 17:51:51 Level 1) 100 % Output: 0 Volts peak NEMA-TS 2.1.9 진동

Demand: 0.5 G Level Time: 1:00:00 Frequency: 30Hz

Control: 0.001208 G Total Time: 1:00:11 End of Timed Test

X axis

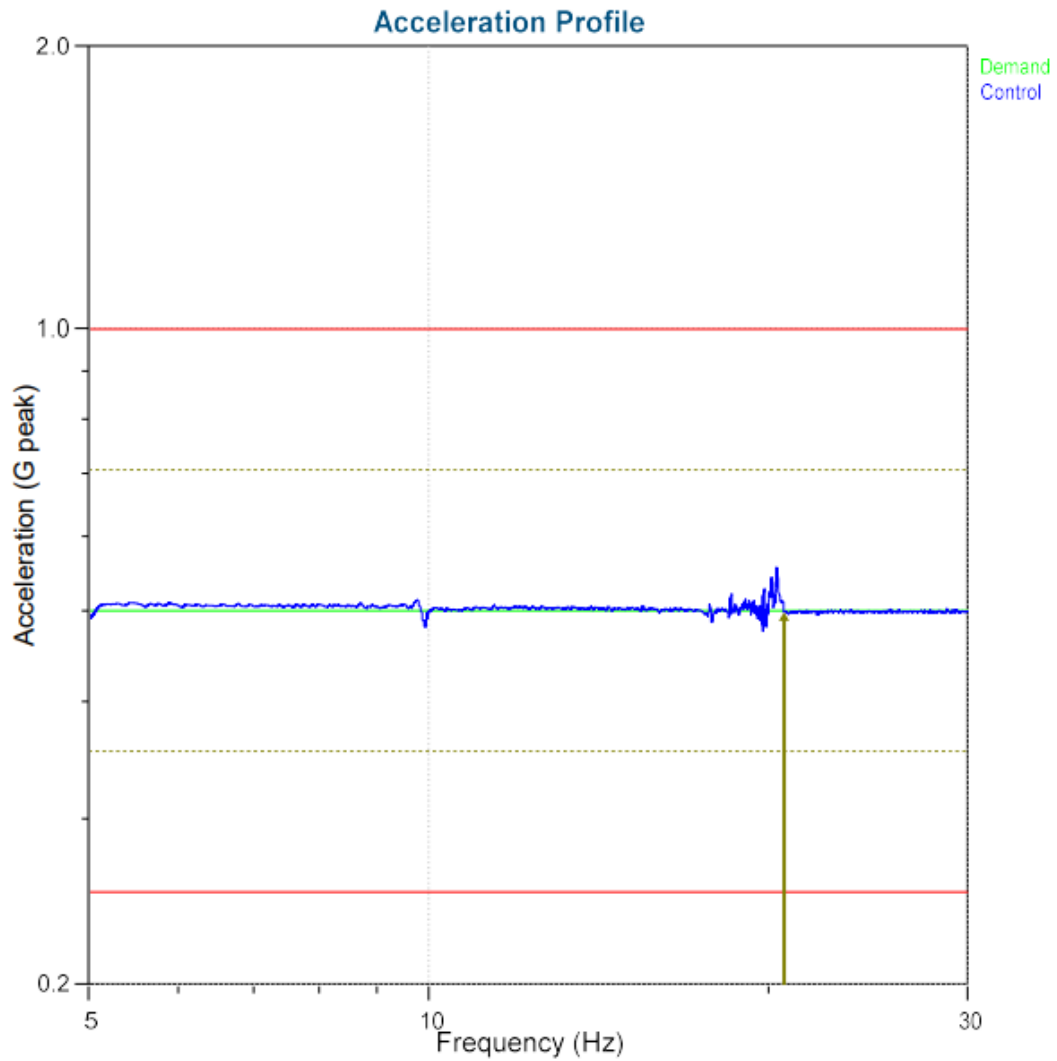


CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (18) / (25) pages

4.5.3 Test Data Z Axis



8 19, 2025 15:29:29 Level 1) 100 %

Output: 0 Volts peak

2025-04-02 NEMA-TS2.1.9

Demand: 0.5 G

Level Time: 1:00:00

Frequency: 30 Hz

Control: 0.0008126 G Total Time: 1:00:11

End of Timed Test

X axis

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (19) / (25) pages

5. Shock(impact) Test [NEMA TS 2-2013 2.1.10]

5.1 Test date and environmental conditions

5.1.1 Test date: Apr. 18, 2025 ~ Apr. 19, 2025

5.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.8	45.2	89.9

5.2 Test conditions and methods

5.2.1 Sample status: unpackaged / not in operation

5.2.2 Applied waveform: Half sine

5.2.3 Acceleration(G): 10 G

5.2.4 Nominal duration (ms): 11

5.2.5 Applicable axis : X, Y, Z

5.2.6 Number of impacts: 1 per direction (total 6)

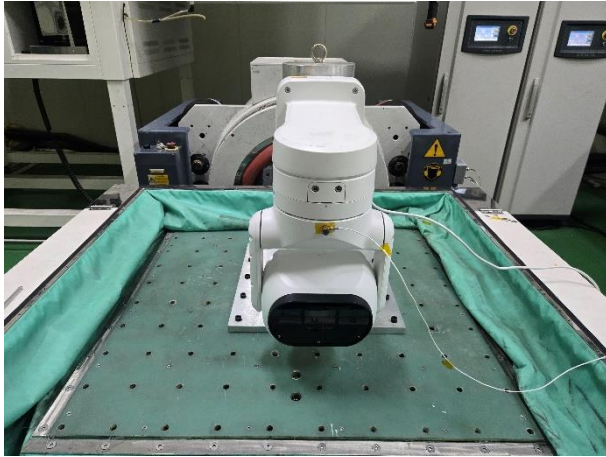
5.2.7 Evaluation items: Check for mechanical damage before and after testing

5.2.8 Test methods

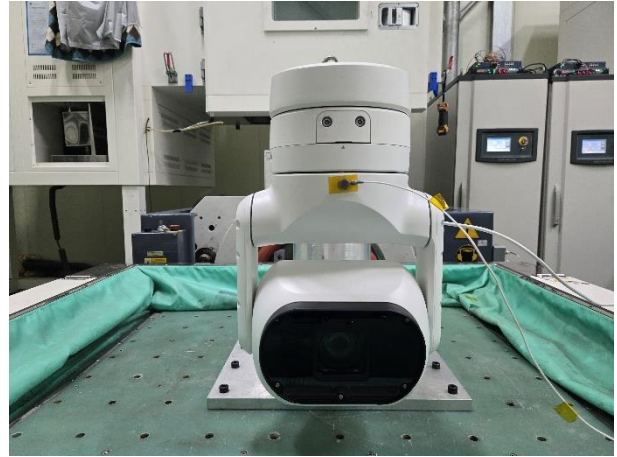
The major units of the CA shall suffer neither permanent mechanical deformation nor any damage that renders the unit inoperable, when subjected to a shock of 10g applied in each of three mutually perpendicular planes.

5.3 Testing images

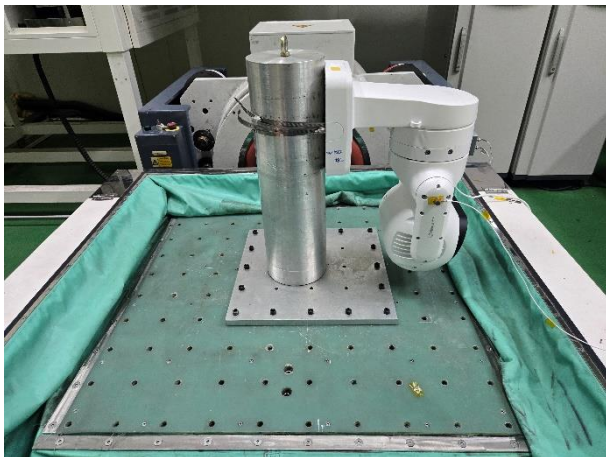
5.3.1 Evidence of test setting (NEMA TS 2-2013 2.1.10)



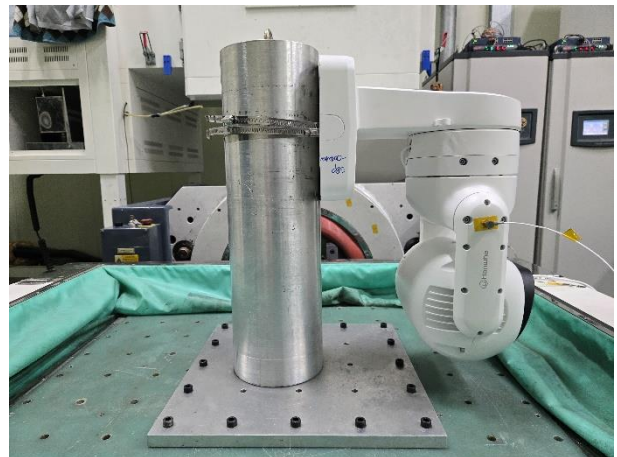
X axis_1



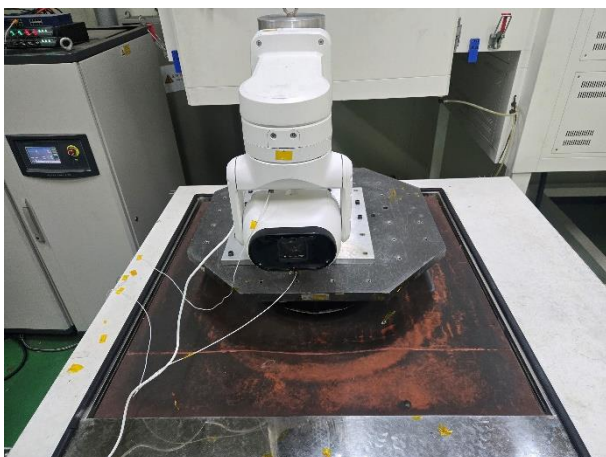
X axis_2



Y axis_1



Y axis_2



Z axis_1



Z axis_2

**CTK Co., Ltd.**

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (21) / (25) pages

5.4 Test Result

5.4.1 Test result table

Evaluation Criteria		Test Results	Comment
Shock(impact) Test	Before	Normal	
	After	Normal	



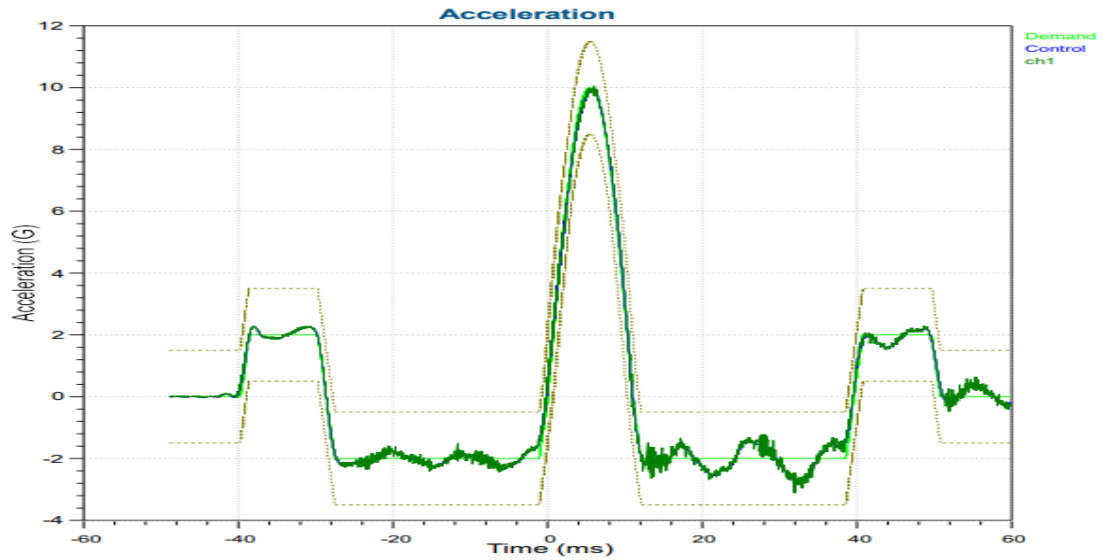
CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

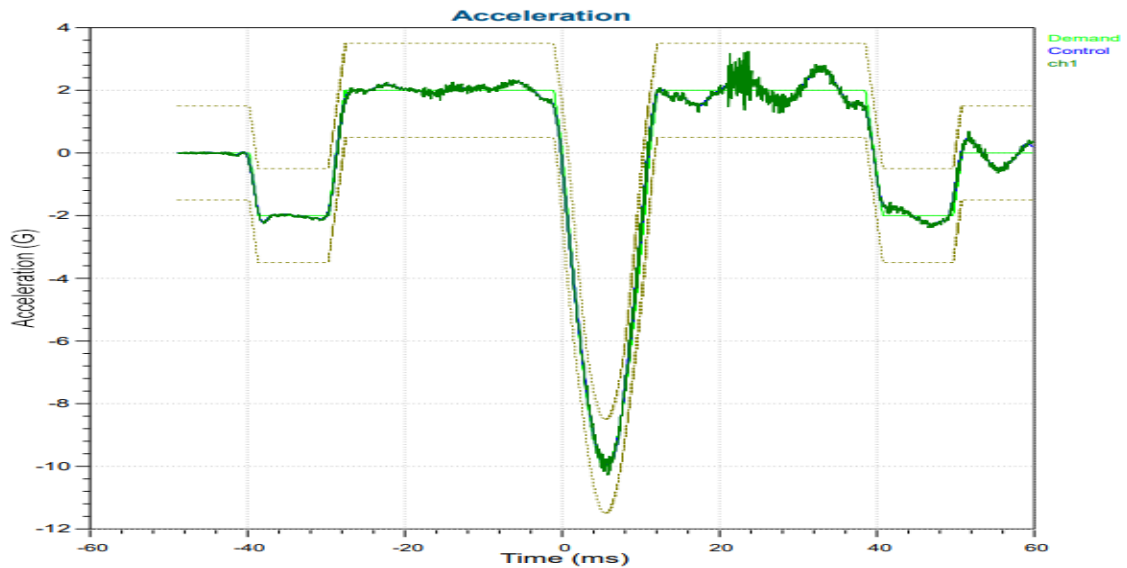
REPORT No.:
CTK-2025-02421
Page (22) / (25) pages

5.5 Test Data

5.5.1 Test Data X Axis



X+



X-

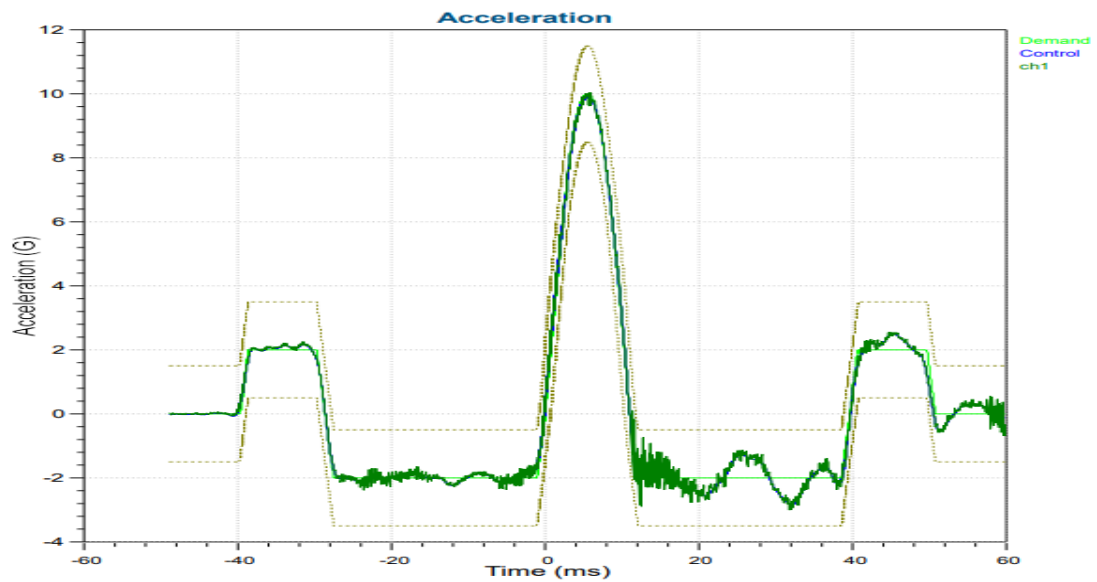


CTK Co., Ltd.

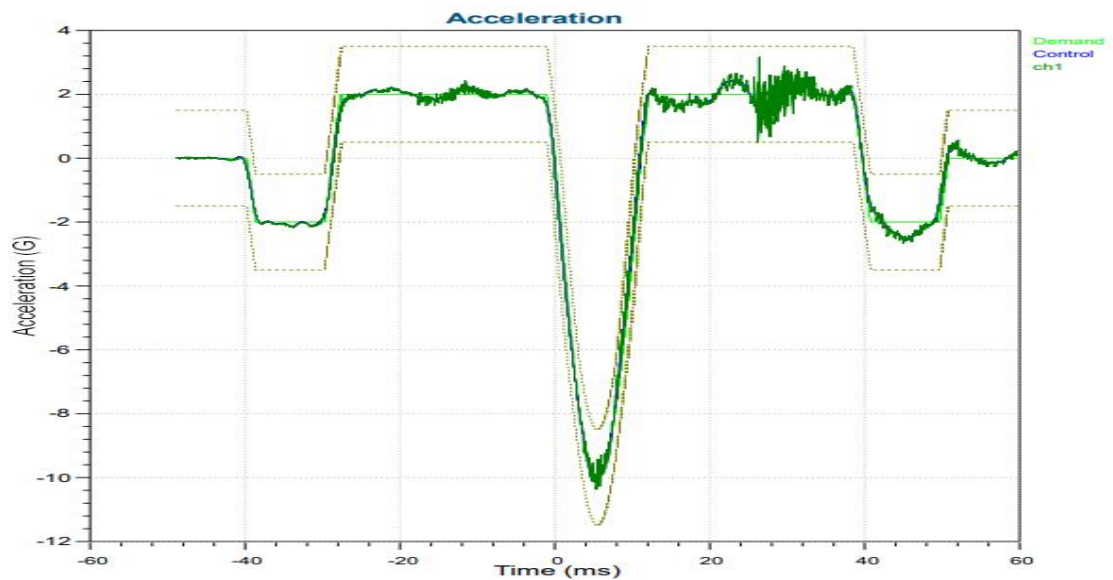
5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (23) / (25) pages

5.5.2 Test Data Y Axis



Y+



Y-

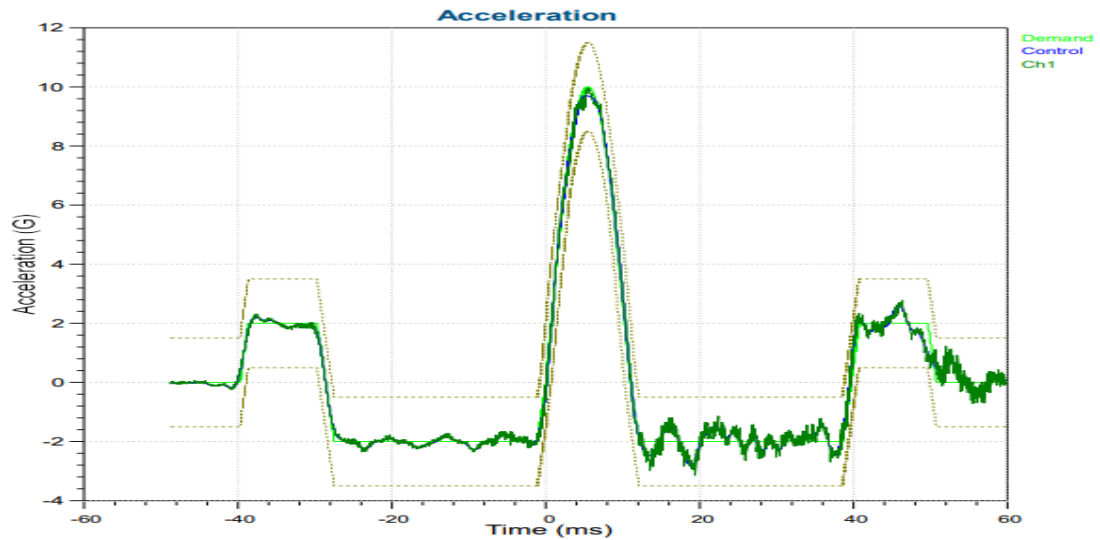


CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02421
Page (24) / (25) pages

5.5.3 Test Data Z Axis



8 19, 2025 15:30:05 Level 1) 100 %

Output: 0.6868 Volts peak

NEMA-TS 2.1.10

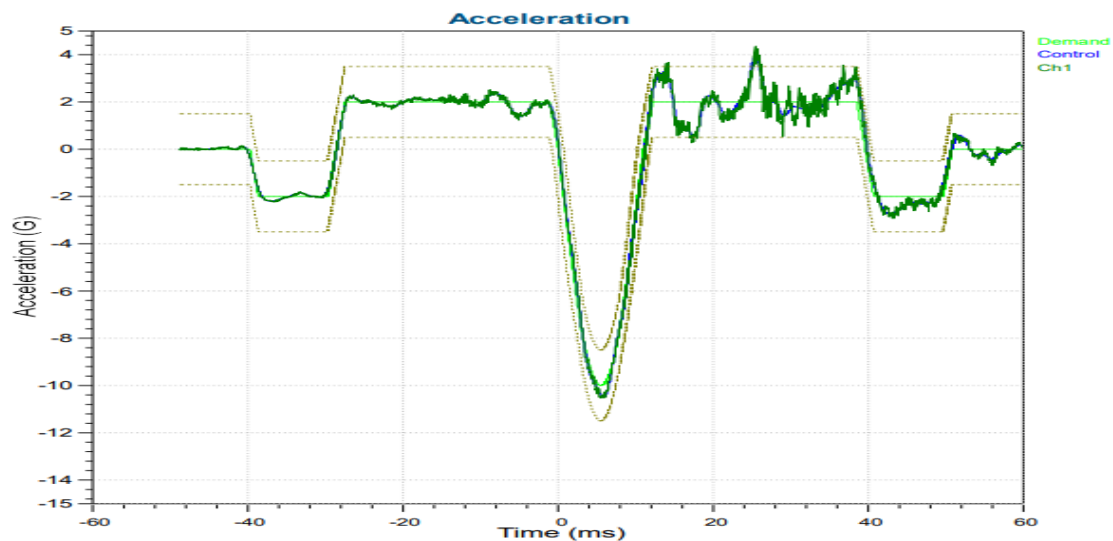
Demand: 10 G

Control: 9.7 G

Pulse: 1 of 1

Running

Z+



8 19, 2025 15:30:11 Level 2) 100 %

Output: 0.6854 Volts peak

NEMA-TS 2.1.10

Demand: 10 G

Control: 10.47 G

Pulse: 1 of 1

End of Test

Z-

5.6 Post-test product images

5.6.1 Test sample



Top



Bottom



Front



Rear



Left side



Right side

- End -