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Package Test Report for BFX-UA300 (K18X001T00)

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Revision Change History

Revision	Description of Change	Date
1.0	Initial Release	09/13/2021

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Purpose:

1. Provide a formal functional demonstration of the product design reliability.
2. Identify any design discrepancies.
3. Reliability assurance of trial samples which are designed and fabricated in accordance with the customer's product specifications.
4. Conduct robustness testing on early production samples in accordance to customer's product environmental testing specification.

Scope:

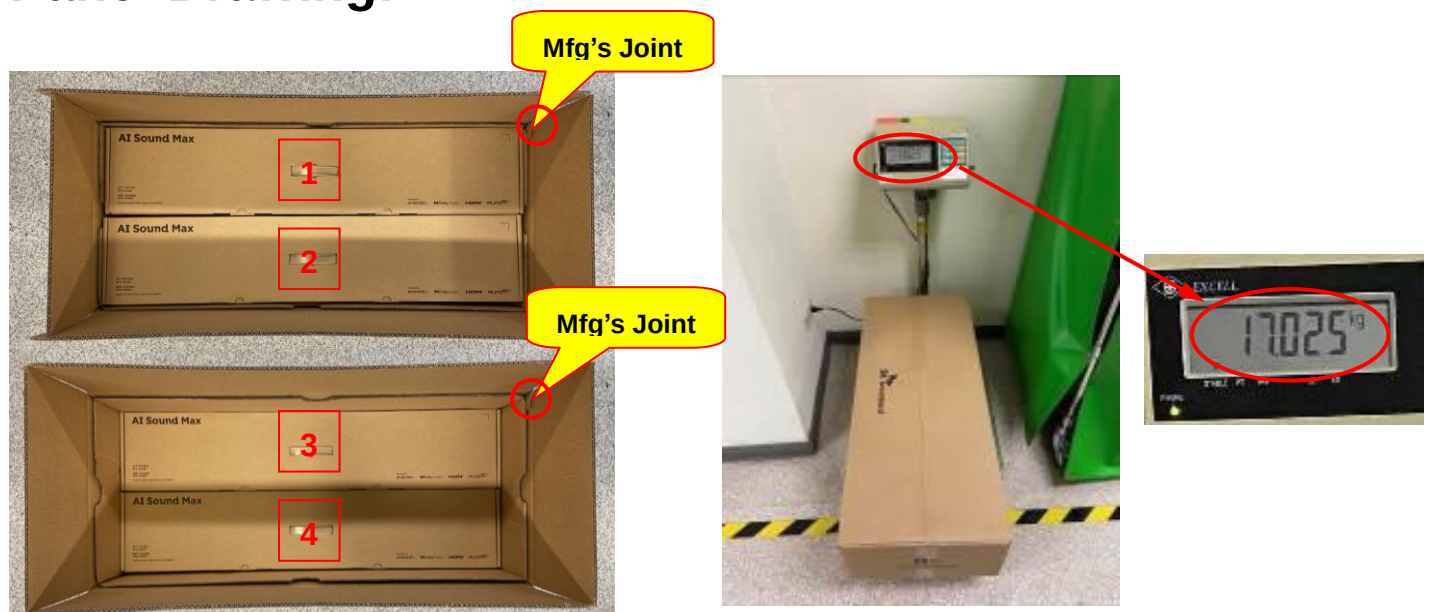
This document describes the performance requirements, validation criteria, and the validation tests which focus on BFX-UA300 (K18X001T00) product.

The DUT H/W revision is V125 and S/W revision is 19.524.23.

The summary of test items:

No.	Item	Test Condition	Q'ty	Period	Pass Criteria	Test result
1	Temperature and Humidity Test	Power off, Storage, Ta =38°C, Humi.= 85%R.H. for 72 hrs	1 carton	3 days	No obvious visible damage on boxes after temperature and humidity test.	PASS
2	Static Compression Test	1. Apply a static load "Wt x (S - 1) x F" for 1 hour. 2. Wt: Total weight of the packaged-product. 3. S: Total number of packaged-products in a stack. 4. F: Compensating factor=5	1 carton	1 day	No obvious visible damage on boxes after Static Compression Test.	PASS
3	Random Vibration Test	1. Face 3 rests on the platform for 30 mins 2. Face 1 rests on the platform for 10 mins 3. Face 2 or 4 rests on the platform for 10 mins 4. Face 5 or 6 resets on the platform for 10 mins 5. Frequency : 1...4...100...200 6. PSD : 0.0001...0.01...0.01...0.0001	1 carton	1 day	No obvious visible damage on boxes after fixed displacement test.	PASS
4	Free Fall Drop Test	< 10 Kg, drop 97 cm, 10 ~ 19 Kg, drop 81 cm, 19 ~ 28 Kg, drop 66 cm, One corner, three edge, six faces, total ten drop.	1 carton	1 day	No obvious visible damage on boxes after fixed displacement test.	Fail
5	Fix Displacement Test	Displacement: 25mm Duration: 14,200 times	1 carton	1 day	No obvious visible damage on boxes after fixed displacement test.	Done

Panel Drawing:



1. Temperature and Humidity Test

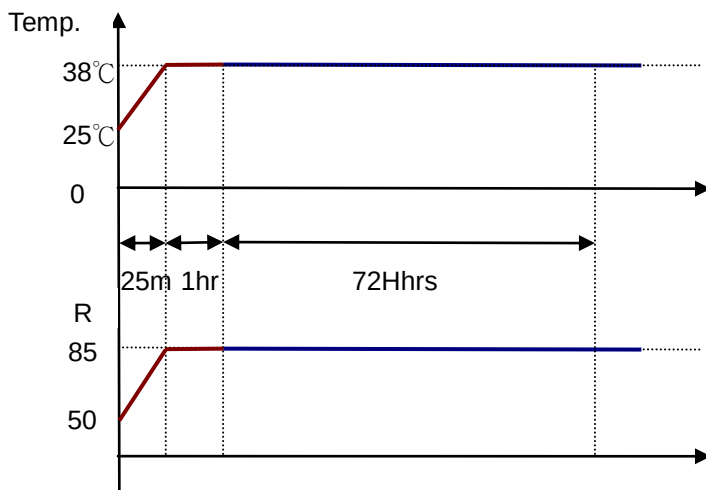
Purpose:

To demonstrate that packaged can withstand the temperature and humidity of an storage environment.

Quantity: 1 Carton

Test Objective: Operating Temperature and Humidity: Temp. +38°C and RH 85%, Duration: 3 days

Test Profile:



Test Procedure:

1. Power off.
2. Start test at 25°C and RH 50%.
3. Ramp the temperature to 38°C and RH 85% in 25 minutes, then hold for 1 hour.
4. Power on the test units.
5. Hold 38°C, RH 85% for 72 hours.

Pass Criteria:

1. No obvious visible damage on boxes after temperature and humidity test.

Basis for Profile: ISTA-2A

Test Result: **PASS**

2. Static Compression Test

Purpose:

The purpose of this test is to ensure a packaged product can withstand compressive forces that occur during normal transportation and warehousing operations.

Quantity: 1 Carton

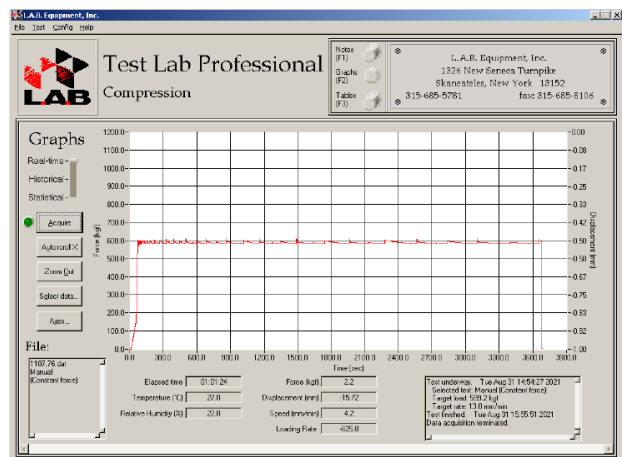
Test Objective:

1. Apply a static load $Wt \times (S - 1) \times F = 17.12 \times (8 - 1) \times 5 = 599.2 \text{ kgf}$.
 2. Wt : Total weight of the packaged-product.
 3. S: Total number of packaged-products in a stack
 4. F: Compensating factor (Typical range 3 to 6)
- Compression rate : 13 mm / minute
Compression test duration : 1 hour
Compression direction : Top to bottom

Test Profile:



Test setup



Test waveform

Test Procedure:

1. Compression testing is required for all shipping containers that are transported as stand-alone packages during transit.
2. Samples to be pre-conditioned for 24 hours at $25 \pm 10^\circ\text{C}$ / $50 \pm 25\%$ R.H. Floating platen machine is recommended, but fixed platen is acceptable
3. Compression rate = $0.5''/\text{min}$
4. After the test, the mechanical structures should be without damage, loose, or deformity

Pass Criteria:

1. No distortion.
2. Any different between before and after must be noted.

Basis for Profile: ISTA-2A

Test Result: **PASS**

3. Random Vibration Test

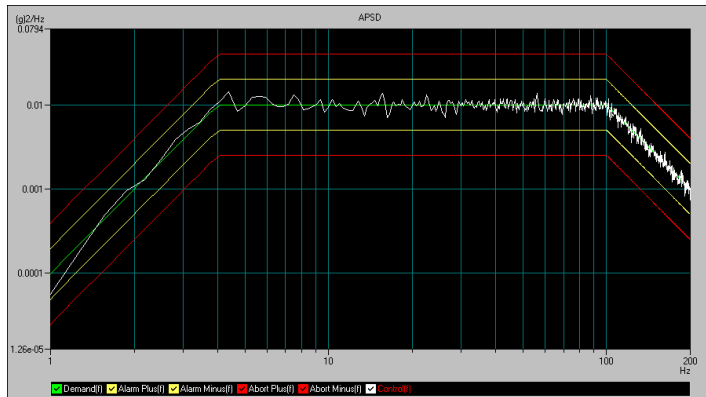
Purpose:

To reveal the accumulated effects of stress induced by the random vibration and the resulting mechanical weakness and degradation in specified performance and to use this information, in conjunction with the relevant specification to assess the acceptability of specimens. To demonstrate the mechanical robustness of specimens.

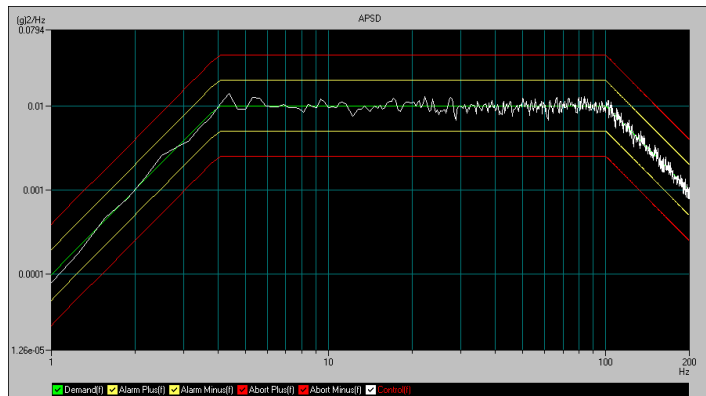
Quantity: 1 Carton

Test Objective: 1. ASD: 1 (m^2/s^3), Test severity: - 3dB/oct, Freq. range: 1...200 Hz,
2. Carton (4 EUTs): 17.025 kg.

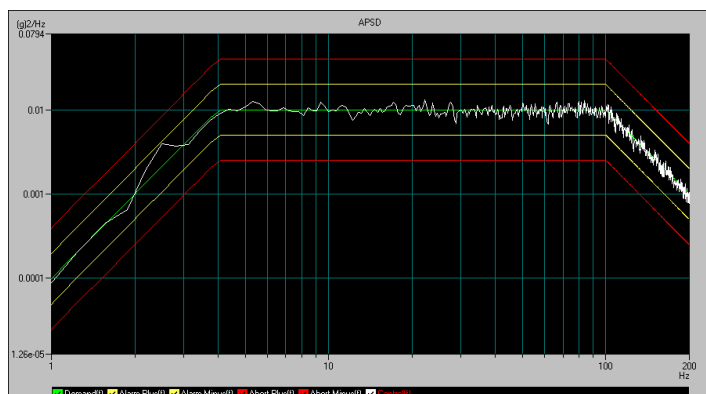
Test Profile:



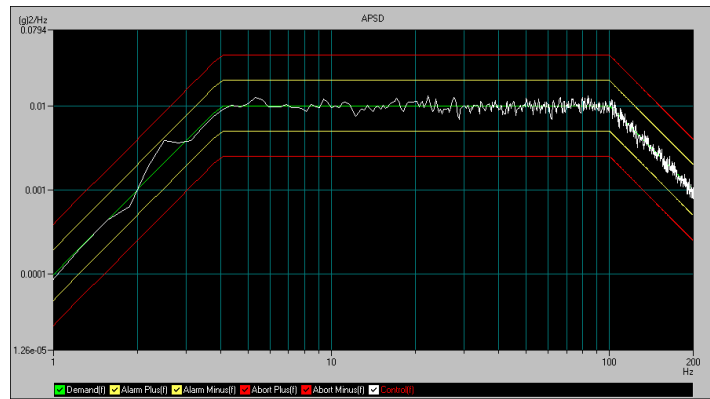
Face 3



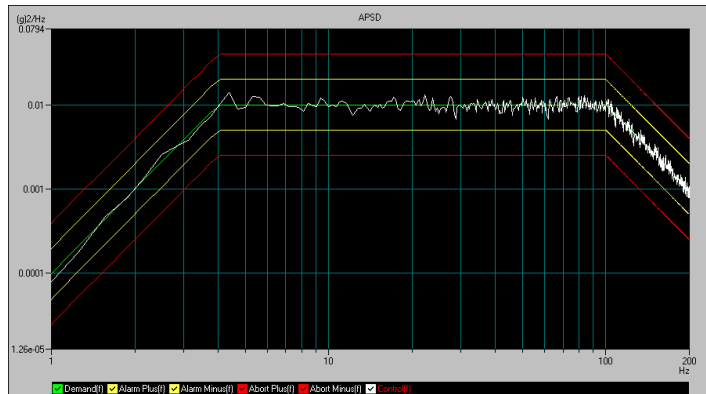
Face 1



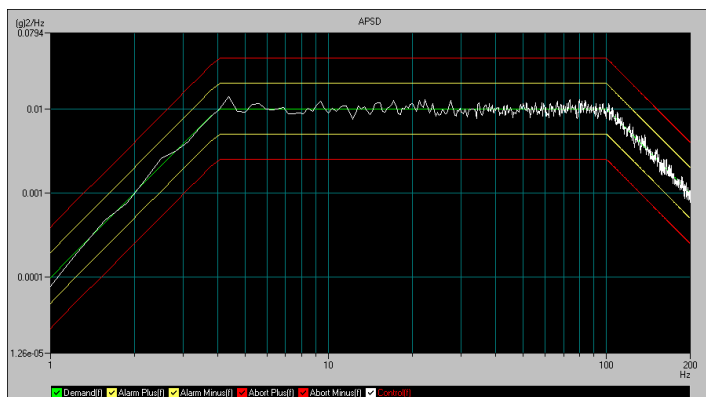
Face 5



Face 6



Face 2



Face 4

Test Procedure:

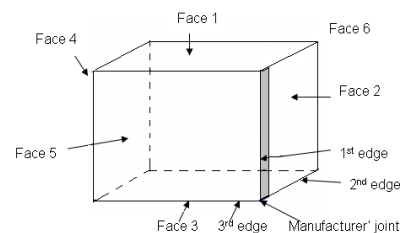
1. Fix the carton on vibration mechanism.
2. Set the test program as above condition: ASD: 1 (m^2/s^3), Test severity: - 3 dB/oct, Freq. range: 1...4...100...200 Hz, Axis, PSD: 0.0001...0.01...0.01...0.0001
3. Face 3 rests on the platform for 30 minutes
4. Face 1 rests on the platform for 10 minutes
5. Face 2 or 4 rests on the platform for 10 minutes
6. Face 5 or 6 rests on the platform for 10 minutes
7. Check the mechanical and function after the test.

Pass Criteria:

1. No obvious visible damage on boxes after random vibration test

Basis for Profile: ISTA-2A

Test Result: **PASS**



4. Free Fall Drop Test

Purpose:

To assess the effects on a specimen of simple standard test intended to be representative of the fall likely to be experience during rough handling, or to demonstrate a minimum degree of robustness, for the purpose of assessing safety requirements.

Quantity: 1 Carton

Test Objective: Carton weight: 17.025 kg

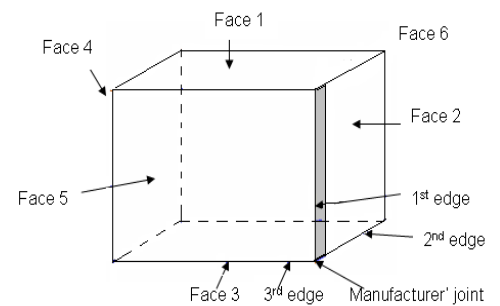
Drop height: 81cm

Surface: steel surface

Drop sequence: one corner, three edges, and six faces

Packaged-Product Weight				Drop Height	
Equal to or greater than		But Less than		Free Fall	
lb	kg	lb	kg	in.	mm
0	0	21	10	38	970
21	10	41	19	32	810
41	19	61	28	26	660
61	28	100	45	20	510
100	45	150	68	12	310

Drop	Impact surface
1	Corner 2-3-5
2	Edge 2-5
3	Edge 2-3
4	Edge 3-5
5	Face 4
6	Face 2
7	Face 6
8	Face 5
9	Face 3
10	Face 1



Test Profile:



Corner 2-3-5



Edge 2-5



Edge 2-3



Edge 3-5



Face 4



Face 2



Face 6



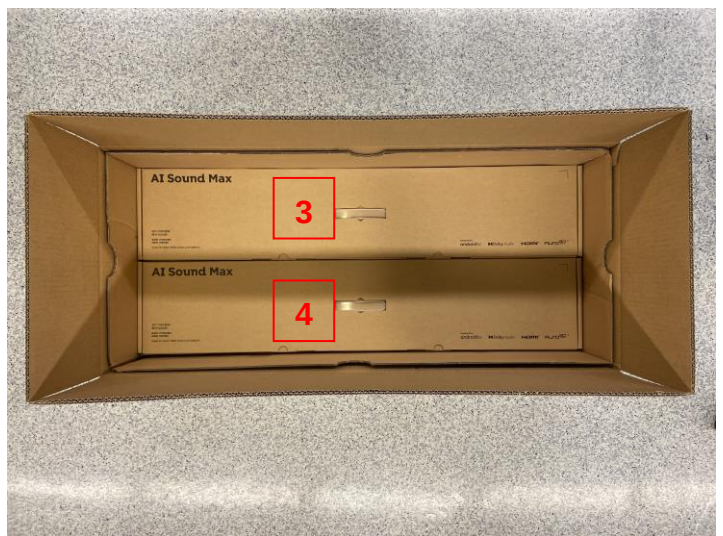
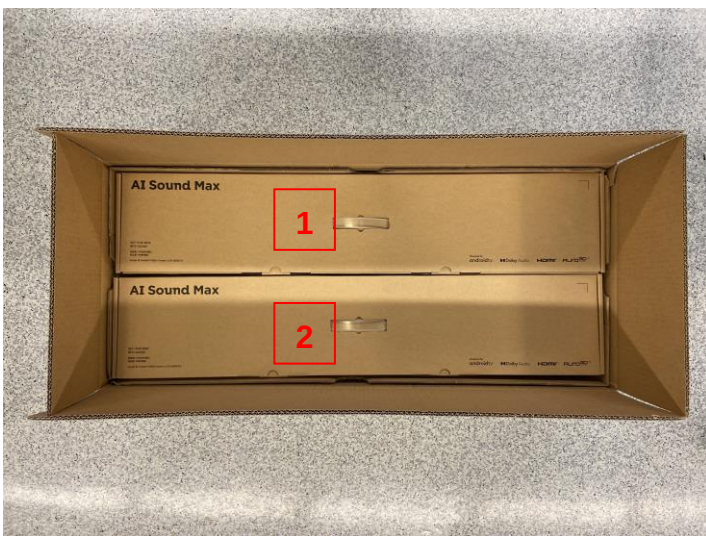
Face 5



Face 3



Face 1



Test Procedure:

1. Put the carton on drop mechanism.
2. Drop 81 cm for one corner, three edge, six faces, and total ten drop.
3. Check the mechanical and function after the test.

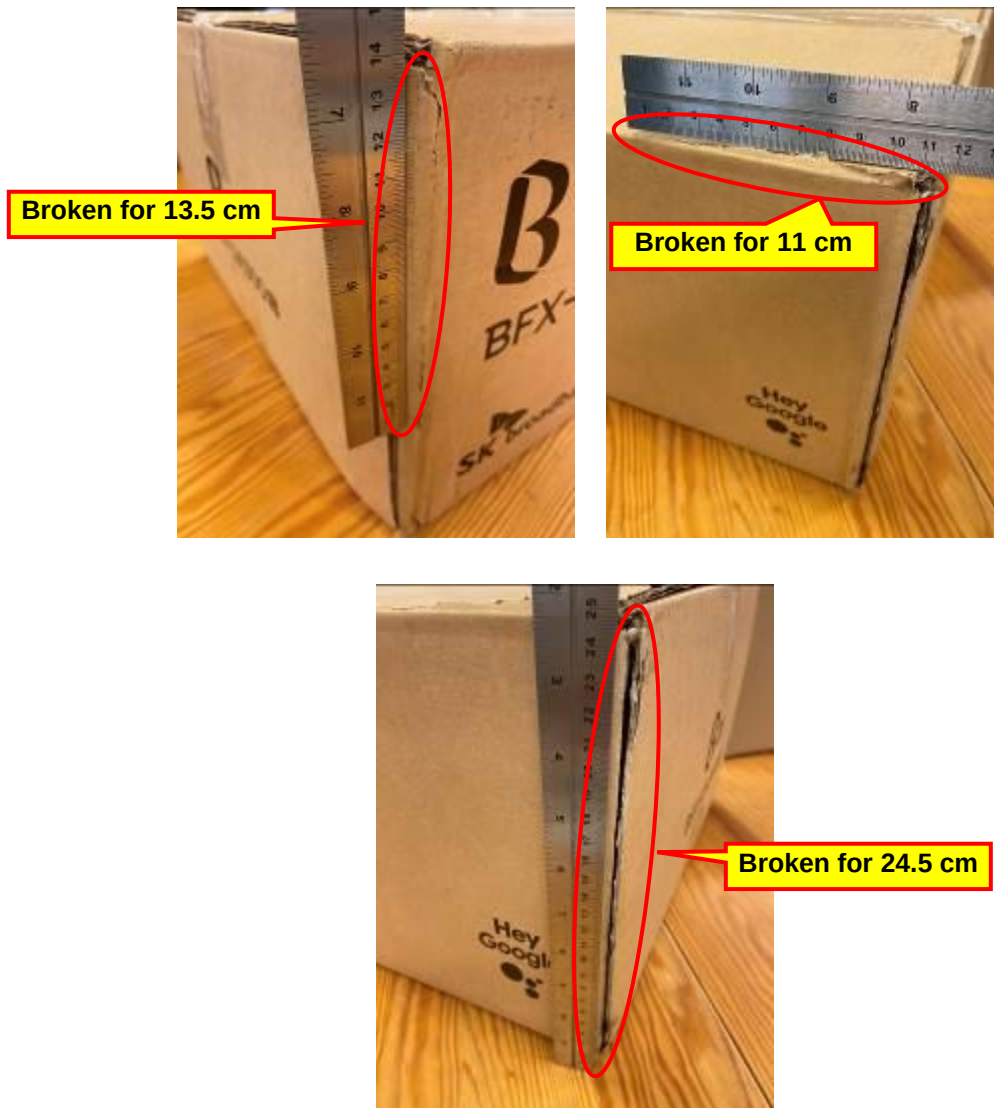
Pass Criteria:

1. No functional failures both before and after the test.
2. No performance degradation after the functional test.
3. No visual damage to the products during inspection, such as peeling, crack, missing pixels, discoloration, broken partition, pizza box or any package of the accessory kit etc.

Basis for Profile: ISTA-2A

Test Result: **Fail**

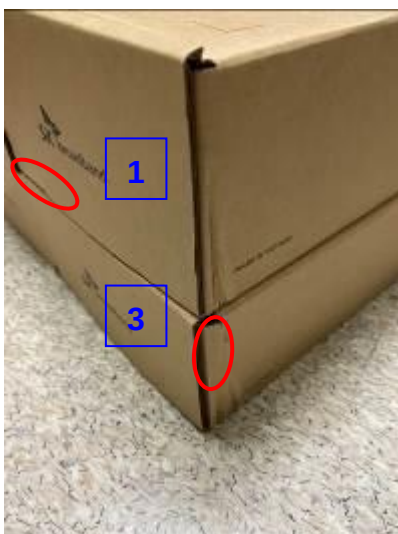
After the test, the carton was broken.



After the test, the gift box in carton was broken on carton manufacture's joint side,
Probability : 2/4

Gift-box 1

Gift-box 3



5. Fix Displacement Test

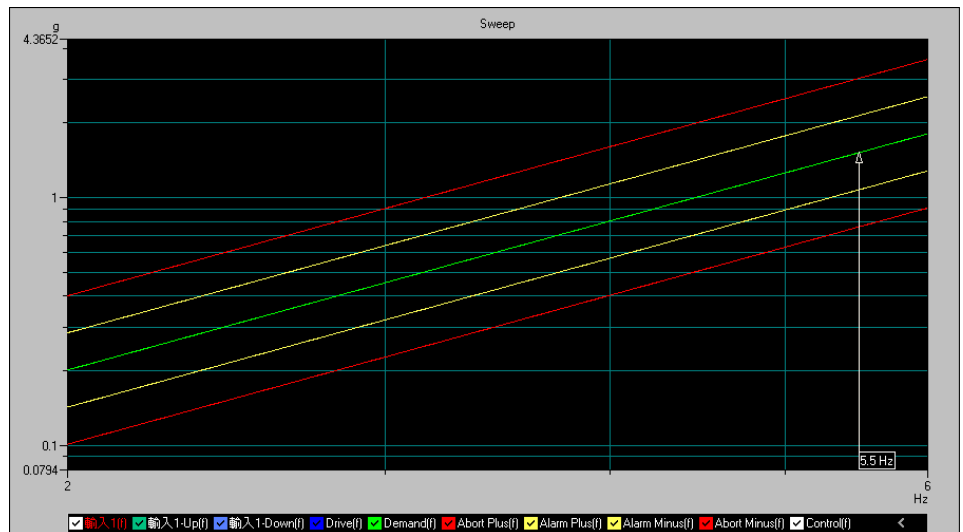
Purpose:

The purpose of this test is to determine the mechanical weakness and/or degradation in specified performance of specimens and use this information, in conjunction with the relevant specification, to decide the acceptability of the specimens.

Quantity: 1 carton

Test Objective: Displacement: 25mm, Duration: 14,200 times.

Test Profile:



Test Procedure:

1. Put the packaged-product on the vibration table so that bottom side rest on the platform.
2. Start the vibration system to vibrate at 1 inch (25mm) total displacement at the machine's lowest frequency.
3. Maintain a fixed displacement at 1 inch (25mm) and slowly increase the frequency of the vibration table until the packaged-product begins to momentarily leave the surface of the platform.
4. Hold the frequency to that determined in next step.
5. Can a metal shim be intermittently moved between the bottom of the longest dimension of the packaged product and the surface of the platform? If yes, go step 6! If not, go back to step 3. (To decide package bounce height)
6. Dwell frequency is 5.5 HZ and complete impacts 14,200 times.

Pass Criteria:

1. No obvious visible damage on boxes after test.

Basis for Profile: ISTA-2A

Test Result: Done