

Report Details

Products tested	VCCR300-xx
Products Description	300W DC-DC power supply.
Design Phase	3 – Verification
Product Serials	P/N: VCCR300-24, S/N: 2328CXX0010
Test Goals	Test according to MIL-STD-810G Method 516.6: Transit Drop
Test dates	8 th August to 1 ST September 2023
Report date	4 TH September 2023

Authorisation

Jorge Almendros

4/9/23

Test performed by (Print)

Date

Brian McDonald

4/9/23

Test report written by (Print)

Date

1. Objective

The objective of this report is to show compliance with the requirements of MIL-STD-810G Method 516.6: Transit Drop, Procedure IV: Transit Drop, Table 516.6-VI Transit drop test.

2. Executive summary

Performance tests were carried out on a number of product samples at the Vox Power R&D laboratory and the results recorded. The units were then mounted in a standard 19" rack mount enclosure and shipped to a specialist external laboratory to perform the transit drop test according to the relevant MIL-STD-810G standard. The samples were then returned to the Vox Power R&D laboratory and the performance tests were repeated and compared with the original results. A visual inspection was also carried out to ensure no mechanical damage had occurred during testing.

The details of the performance tests before and after testing are shown in appendix 1.

The details of the visual inspection are shown in appendix 2.

The details of the transit drop testing are shown in appendix 3.

3. Conclusions

The performance test results for the tested samples before and after the transit drop test show no variation in performance.

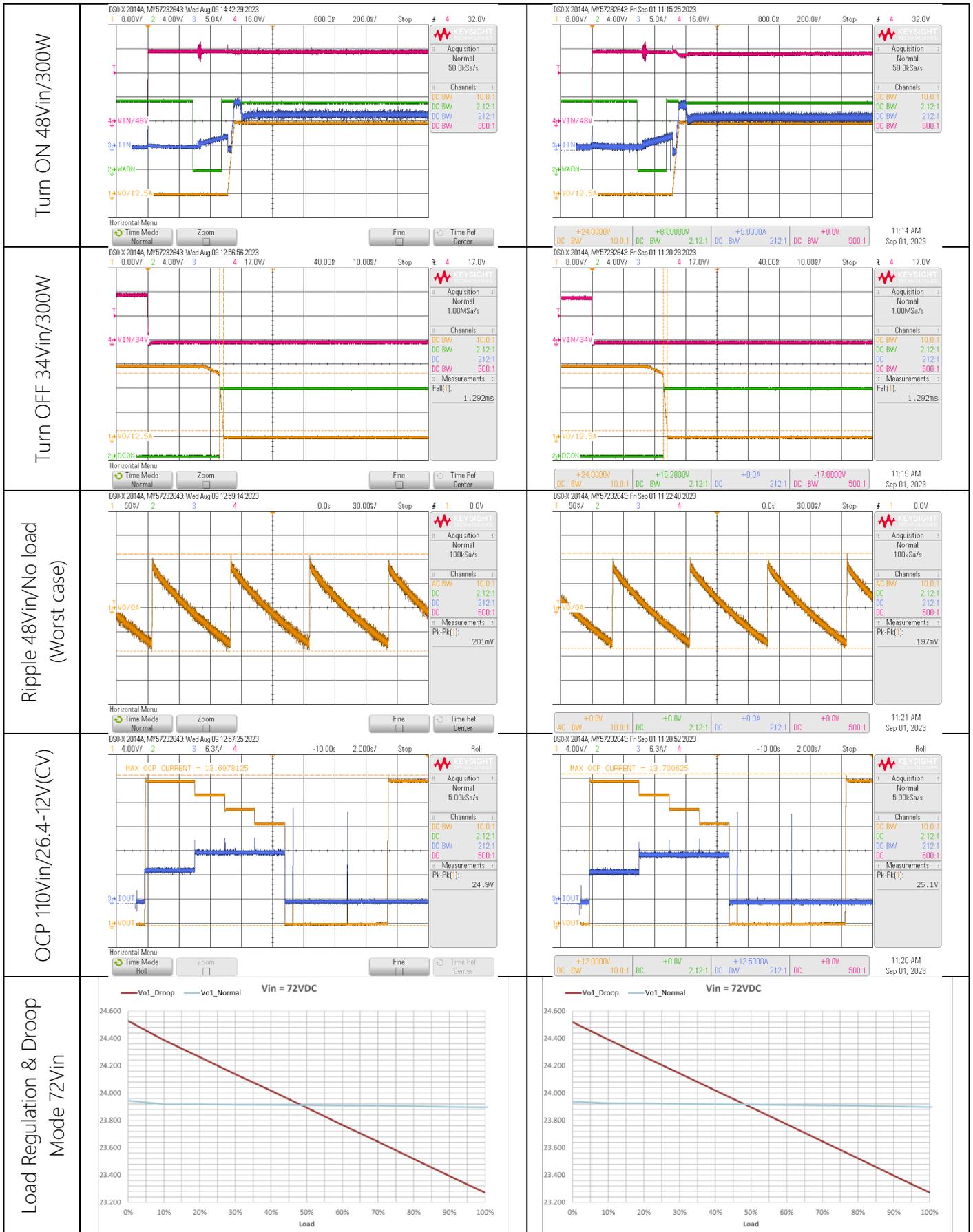
The visual inspection shows that no mechanical issues were observed.

It can be concluded that the transit drop test was passed successfully.

Appendix 1 - Performance Test Results

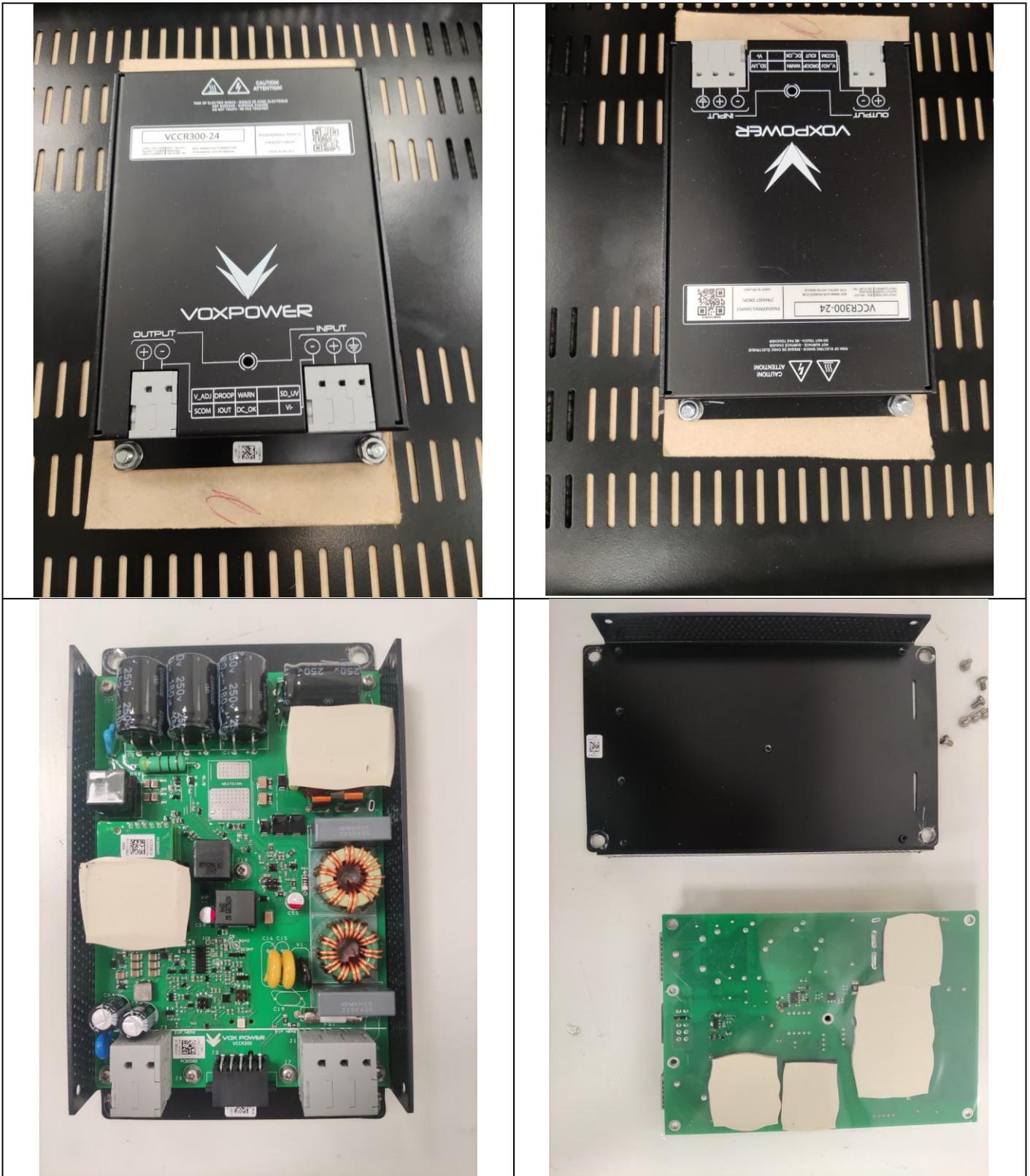
VCCR300-24 Engineering Sample, S/N: 2328CXX0010

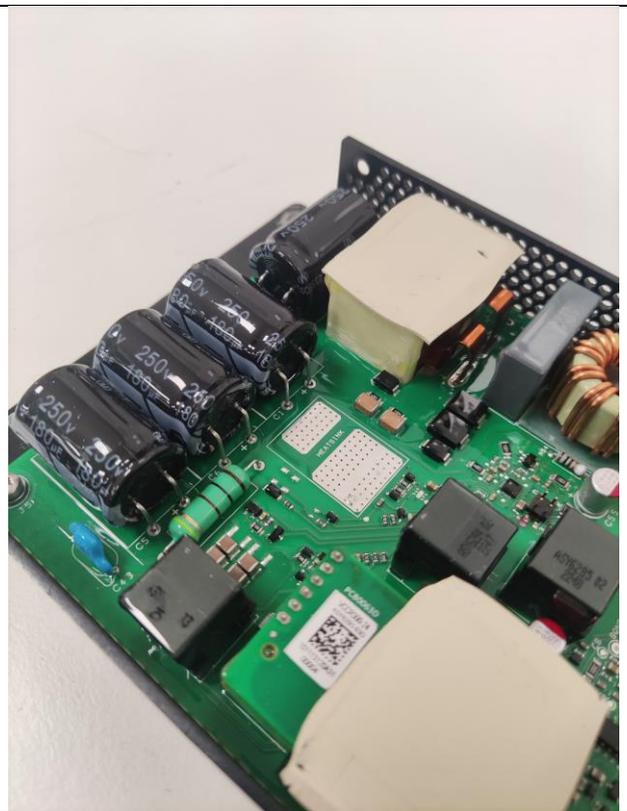
Test	Before Transit Drop Test	After Transit Drop Test
Efficiency		
Power Loss		
Holdup 100Vin/15ms		
Rise Time 96Vin/300W		
Transient 25-75%/48Vin		



Appendix 2 - Visual Inspection

VCCR300-24 Engineering Sample, S/N: 2328CXX0010





Appendix 3 – Transit Drop Test

 <p>Resonate TESTING LIMITED A NACELLE GROUP COMPANY</p>	<p>Test Report Drop</p>	<p>Record No: RTL00535 D0026 Rev No: 1 2023-09-04 Document Status: Approved</p>
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DROP TEST REPORT FOR VOX-POWER

MIL-STD-810G DROP: METHOD 516.6: PROCEDURE VI: TRANSIT DROP

Author: (Name)	Author: (Signature)	Date:
Phillip Fee		2023-09-04
Approver: (Name)	Approver: (Signature)	Date:
Conor Barry		2023-09-04

Customer:	Vox-Power Ltd
PO Number:	PO 11496
Contact Name:	Jorge Almendros
Customer Address:	Vox Power Ltd, Unit 2, Redcow Interchange Estate, Ballymount, Dublin 22, D22 Y8H2
Test Specimen:	P/N: VCCR300-24 S/N: 2328CXX0010
Specimen Receipt Date:	2023-08-31
Date of Test:	2023-08-31
Date of Report:	Iss: 01 2023-09-04
Test Method to be Used:	MIL-STD-810G Method 516.6: Transit Drop Procedure IV: Transit Drop Table 516.6-VI Transit drop test
Any Deviation from Test Method:	N/A
Results summary:	Testing was carried out as per customer's specification. No determination on the pass/fail of the test specimen has been made. Some mechanical damage/degradation of the transit case was observed and recorded.
Customer onsite representatives:	Jorge Almendros
<p>All testing is carried out in compliance with the requirements and specifications detailed above, and the results apply to the specimen tested. Opinions and interpretations are not given by Resonate Testing Ltd.</p> <p>Testing was carried out on this test specimen only and provides no verification for the performance of other items in the same batch, or production run.</p>	

CONTENTS

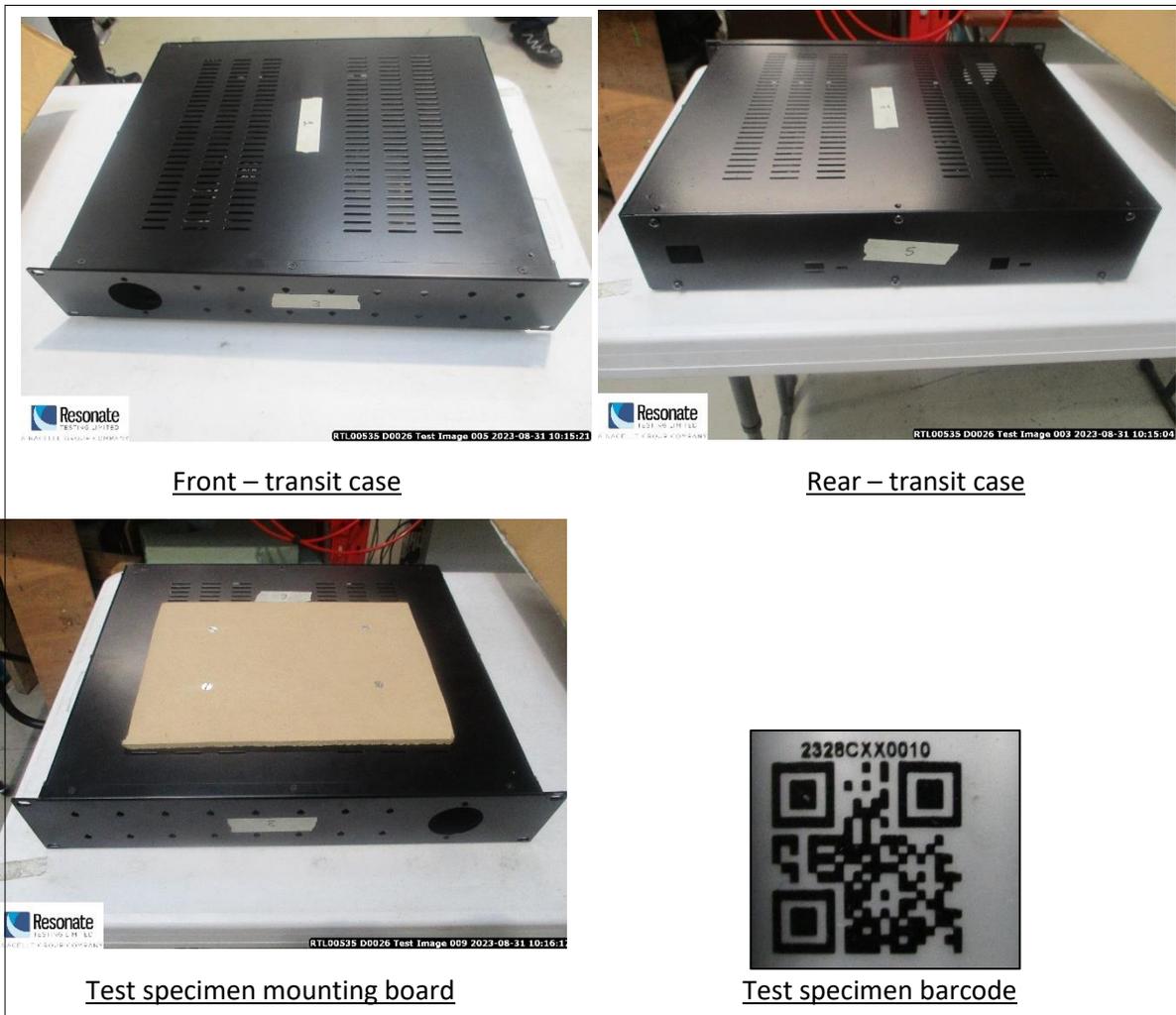
CONTENTS	3
LIST OF FIGURES AND TABLES	4
REVISION HISTORY	5
1 TEST SPECIMEN	6
2 TEST SPECIFICATION	7
2.1 General	7
2.2 Environmental Conditions	7
2.3 Drop Test Requirements.....	7
3 TEST EQUIPMENT AND INSTRUMENTATION	10
3.1 Test Laboratory.....	10
3.2 Test Equipment.....	10
4 PROCEDURE	11
4.1 Drop Testing.....	11
5 DROP TEST RESULTS	14
6 QUALITY ASSURANCE	20
7 SUMMARY	20

LIST OF FIGURES AND TABLES

Figure 1: Test specimen	6
Figure 2: Faces, edges and corners naming convention	8
Figure 3: Test specimen face, edge and corner identification.....	9
Figure 4: Drop test representative image - Faces 1 and 6	11
Figure 5: Drop test representative image - Faces 2, 3, 4 and 5	12
Figure 6: Drop test representative image – Edges 3-4, 4-5, 2-5 and 2-3	12
Figure 7: Drop test representative image – Edges 1-2, 1-3, 1-4, 1-5, 2-6, 3-6, 4-6 and 5-6	13
Figure 8: Drop test representative image – Corners 3-1-4, 3-6-4, 4-1-5, 4-6-5, 5-1-2, 5-6-2, 2-1-3 and 2-6-3	13
Figure 9: Observations after drop 3, Face 2 bending on front plate	15
Figure 10: Observation after drop 4, Face 4, bending on front plate.....	15
Figure 11: Observation after drop 9, corner of transit case front plate bent further	16
Figure 12: Observation after drop 10, corner of transit case front plate bent further	16
Figure 13: Observation after drop 13, corner of transit case front plate bent further	17
Figure 14: Observation after drop 15, bowing of edge	17
Figure 15: Observation after drop 16, edge bowing outwards	18
Figure 16: Observation after drop 19, damage on impact edge.....	18
Figure 17: Observation after drop 23, Corner damage.....	19
Table 1: transit drop test parameters from MIL-STD-810G.....	8
Table 2: List of equipment used.....	10
Table 3: Drop test status.....	14

1 Test Specimen

Customer Description:	VCCR300-24 PSU sample for testing in transit case
Customer Unique ID:	2328CXX0010
Condition on receipt:	Suitable for testing
Testing was carried out on this test specimen only and provides no verification for the performance of other items in the same batch, or production run.	



Front – transit case

Rear – transit case

Test specimen mounting board

Test specimen barcode

Figure 1: Test specimen

2 Test Specification

2.1 General

Testing was carried out in accordance with the customers' requirements as specified in:

Document reference:	MIL-STD-810G Method 516.6: Transit Drop Procedure IV: Transit Drop Table 516.6-VI Transit drop test
Date of receipt:	Received via email from Brian McDonald on 2023-06-29 at 15:55

2.2 Environmental Conditions

The test was carried out under standard laboratory conditions:

Temperature: +15 to +35 degrees Celsius.

Relative Humidity: Not greater than 85 percent.

Ambient Pressure: 84 to 107 kPa (equivalent to +5,000 to -1,500 ft) (+1525 to -460m).

2.3 Drop Test Requirements

Number of drops: 26

Drop height: 122cm

Required faces, edges and corners: Six faces and twelve edges and eight corners.

Required impact surface: Two-inch plywood backed by concrete

Table 1: transit drop test parameters from MIL-STD-810G

Table 516.6-VI. Transit drop test.

Weight of Test Item & Case kg (lbs)	Largest Dimension, cm (in)	Notes	Height of Drop, h cm (in)	Number of Drops
Under 45.4 (100) Manpacked or man-nortable	Under 91 (36)	<u>A/</u>	122 (48)	Drop on each face, edge and corner; total of 26 drops <u>D/</u>
45.4 - 90.8 (100 - 200) inclusive	91 & over	<u>A/</u>	76 (30)	Drop on each corner; total of eight drops
	Under 91	<u>A/</u>	76 (30)	
90.8-454 (200 - 1000) inclusive	91 & over	<u>A/</u>	61 (24)	
	Under 91	<u>A/</u>	61 (24)	
	91 - 152 (36 - 60)	<u>B/</u>	61 (24)	
Over 454	Over 152	<u>B/</u>	61 (24)	Drop on each bottom edge. Drop on bottom face or skids; total of five drops
	No limit	<u>C/</u>	46 (18)	

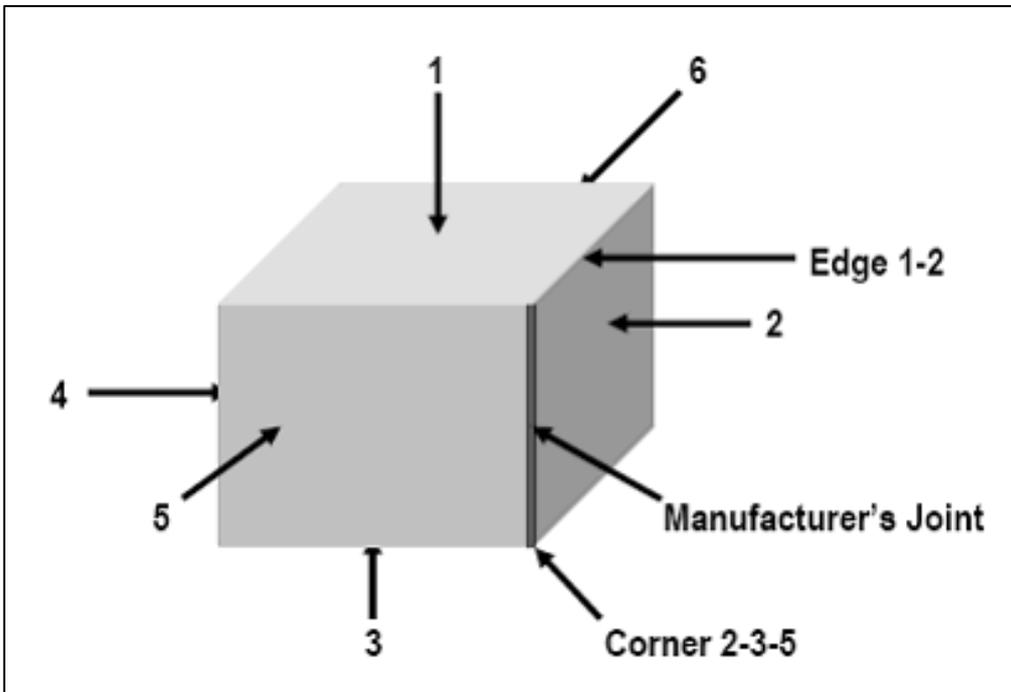


Figure 2: Faces, edges and corners naming convention

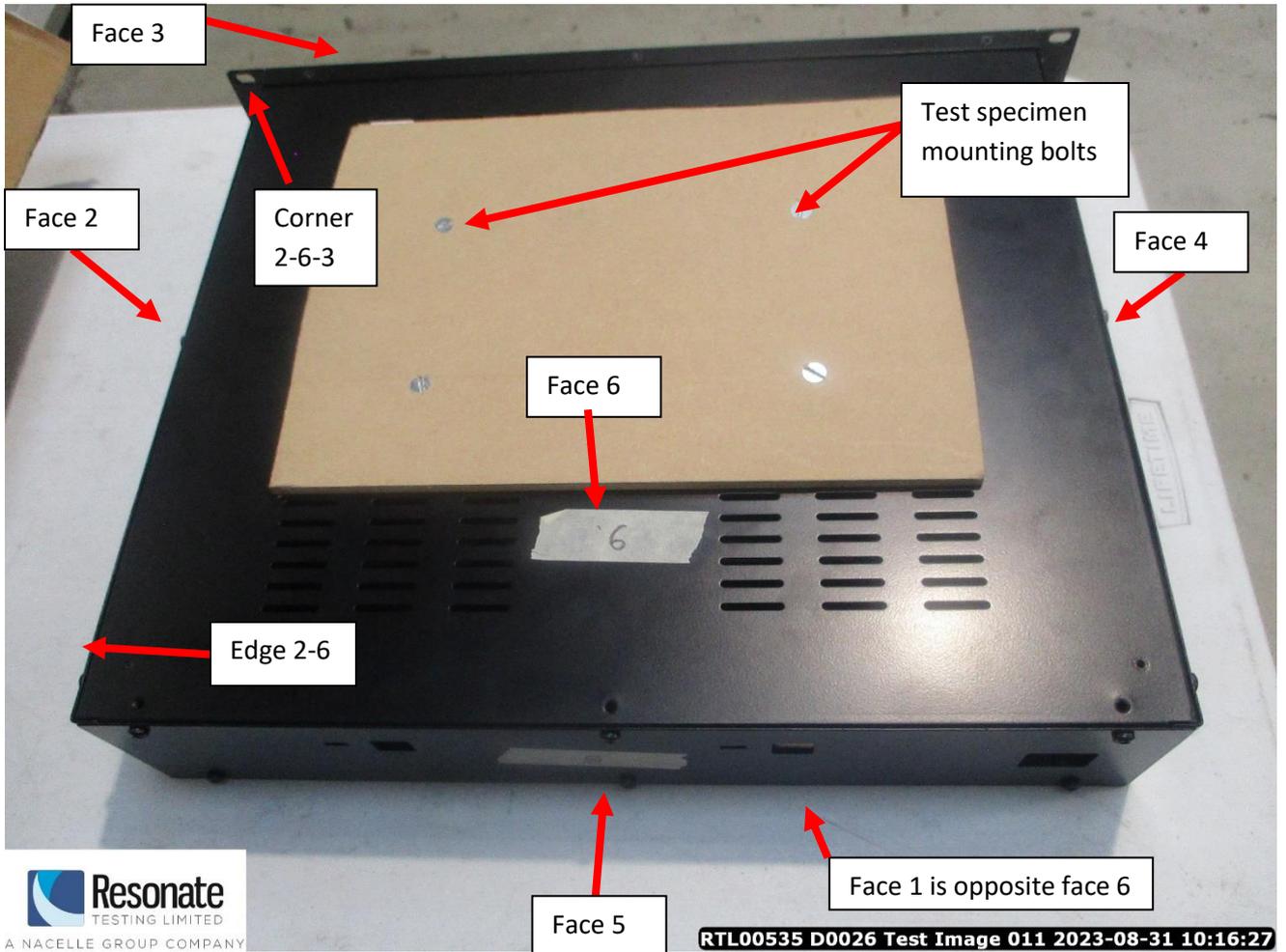


Figure 3: Test specimen face, edge and corner identification

 Resonate TESTING LIMITED A NACELLE GROUP COMPANY	Test Report Drop	Record No: RTL00535 D0026 Rev No: 1 2023-09-04 Document Status: Approved
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3 Test Equipment and Instrumentation

3.1 Test Laboratory

Laboratory Address:	Resonate Testing Limited Unit 1 Bridge Technology Park Carnagat Lane Carnagat Newry BT35 8XF
Test Technician:	Phillip Fee (trainee), Hayley Alcorn
Customer Onsite representative:	N/A

3.2 Test Equipment

All equipment has been calibrated as required using standards traceable to National or International standards.

Table 2: List of equipment used

Ref No:	Serial No:	Use	Type:	Cal Status:	Cal Expiry:	Accuracy
N/A	N/A	Winch, and release mechanism.	Equipment	N/A*	*	*
RA01152	Hultafors 8m Class 1 TL8M	Measuring Drop height	Calibrated Rule	Calibrated	2025/11/03	±0.5mm

*Drop height is adjusted and verified prior to use using the calibrated rule.

4 Procedure

4.1 Drop Testing

The test specimen was subjected to the drop test, in accordance with the specification.

Prior to testing, a visual inspection of the test specimen was carried out by the customer witness, recording any marks/damages before the testing began. The specimen was then mounted for test in the first orientation, as shown in Figure 4. Drop height from specimen test face to impact surface was verified at 122cm, then the release mechanism was activated to allow free fall drop onto the test surface.

After each drop, a visual inspection was carried out on the transit case by the customer witness. Damage was recorded and images taken for reference. This was repeated after each drop until drop in all orientations were completed.

Positioning for each drop is shown in Figure 4 to Figure 8.

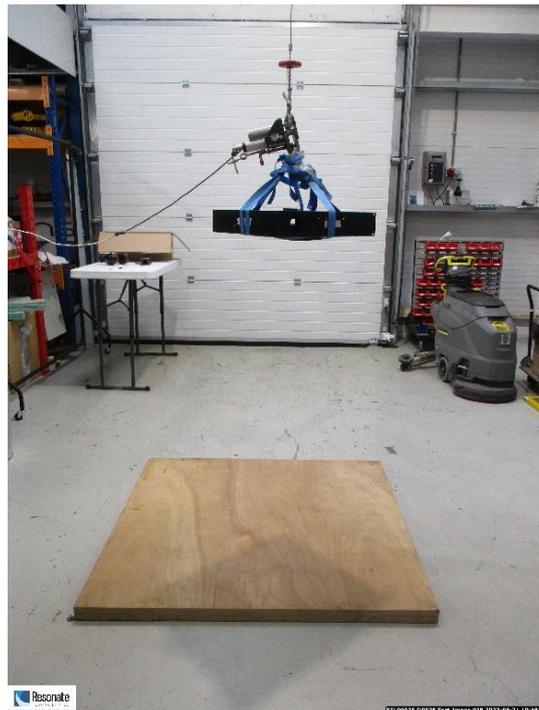


Figure 4: Drop test representative image - Faces 1 and 6

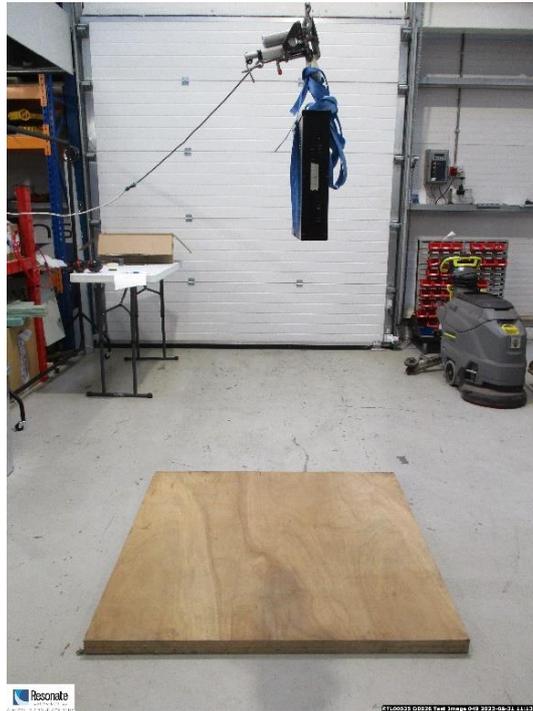


Figure 5: Drop test representative image - Faces 2, 3, 4 and 5

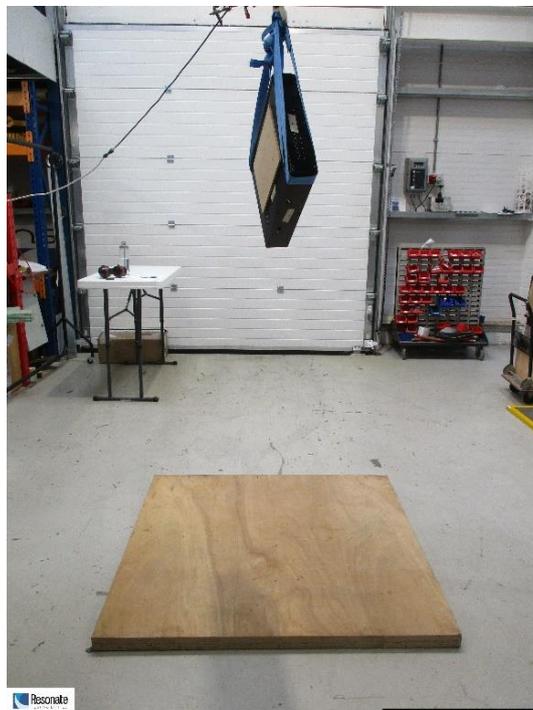


Figure 6: Drop test representative image – Edges 3-4, 4-5, 2-5 and 2-3

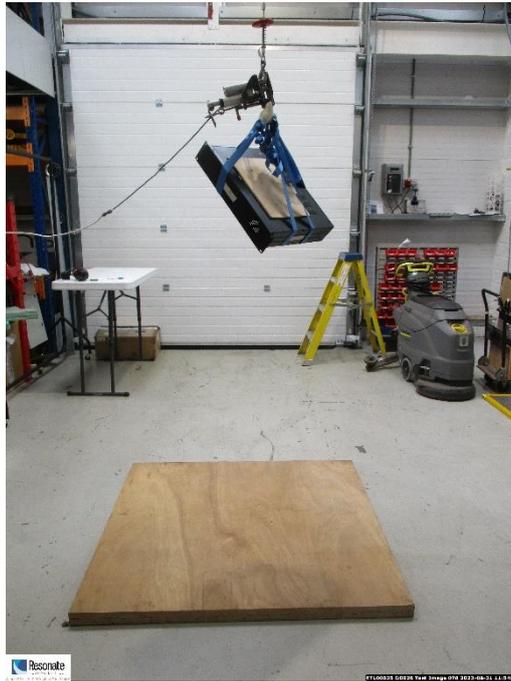


Figure 7: Drop test representative image – Edges 1-2, 1-3, 1-4, 1-5, 2-6, 3-6, 4-6 and 5-6

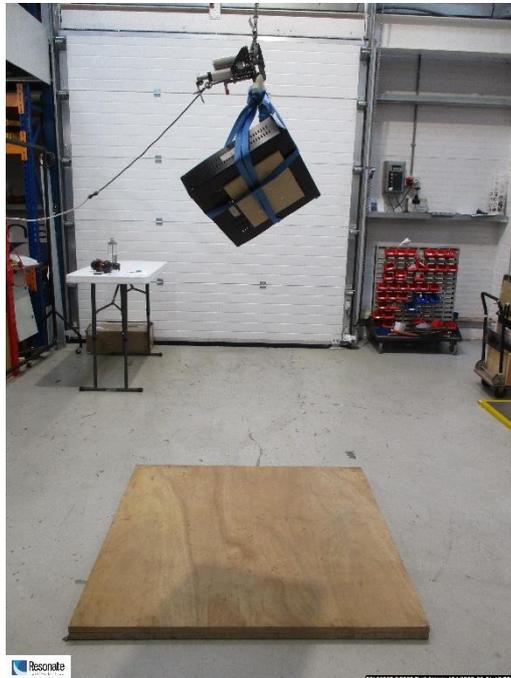


Figure 8: Drop test representative image – Corners 3-1-4, 3-6-4, 4-1-5, 4-6-5, 5-1-2, 5-6-2, 2-1-3 and 2-6-3

5 Drop Test Results

The test specimen underwent drop testing in accordance with the customer requirements. Observations are recorded in Table 3 and Figure 9 to Figure 17.

Table 3: Drop test status

Drop	Drop Orientation	Notes
1	Face 1	10:32 Slight indent on one of cooler slits
2	Face 6	10:45 No issues
3	Face 2	10:52 Slight indent on screws and front mounting plate bent
4	Face 4	11:01 Slight indent on screws and front mounting plate bent
5	Face 5	11:11 Slightly bowed
6	Face 3	11:26 No issues
7	Edge 1-5	11:36 No issues
8	Edge 1-3	11:44 Grazing marks on edge
9	Edge 1-2	11:51 Bent corner of front plate graze markings
10	Edge 1-4	11:57 Bent corner of front plate (Face 3) with grazed markings
11	Edge 6-5	12:05 indentation on both sides of edge and screws started to come loose on front plate
12	Edge 6-3	12:15 Graze marks on edge
13	Edge 6-2	12:21 Bent corner of front plate (face 3) grazing marks
14	Edge 6-4	12:23 Bent corner of front plate and graze markings
15	Edge 4-5	12:30 Bowing of edge 6-4 with graze markings and indent
16	Edge 2-5	12:36 Bowing edge 6-5 and 6-2 graze markings
17	Edge 3-4	12:43 Bent edge of front plate and graze markings
18	Edge 3-2	12:52 Bent edge of front plate
19	Corner 4-6-5	12:55 Corner indented
20	Corner 2-6-5	13:03 Graze markings on corner
21	Corner 3-6-4	14:13 Corner bent further with graze markings
22	Corner 3-6-2	14:17 Corner indented and graze markings
23	Corner 2-1-5	14:23 Corner grazed
24	Corner 5-1-4	14:34 Corner grazed
25	Corner 4-1-3	14:39 Corner grazed
26	Corner 2-1-3	14:44 Corner grazed

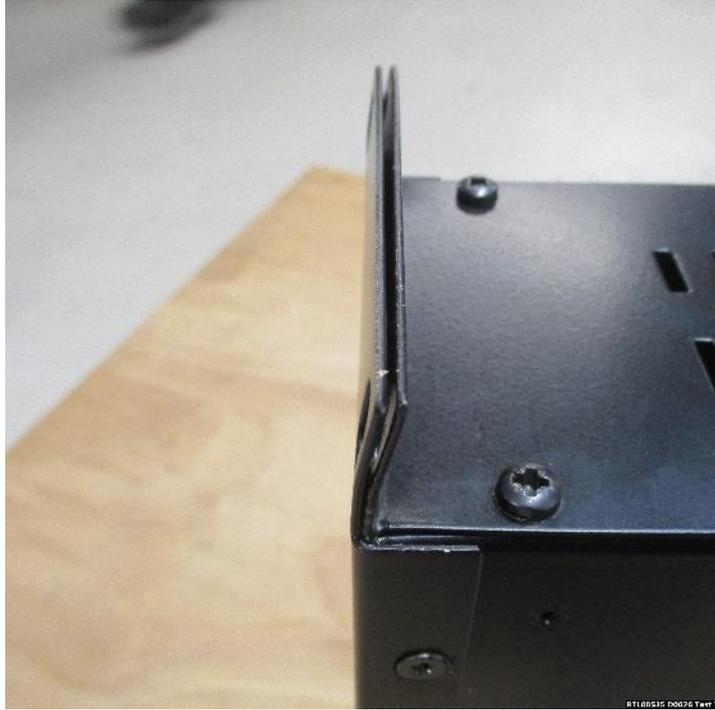


Figure 9: Observations after drop 3, Face 2 bending on front plate

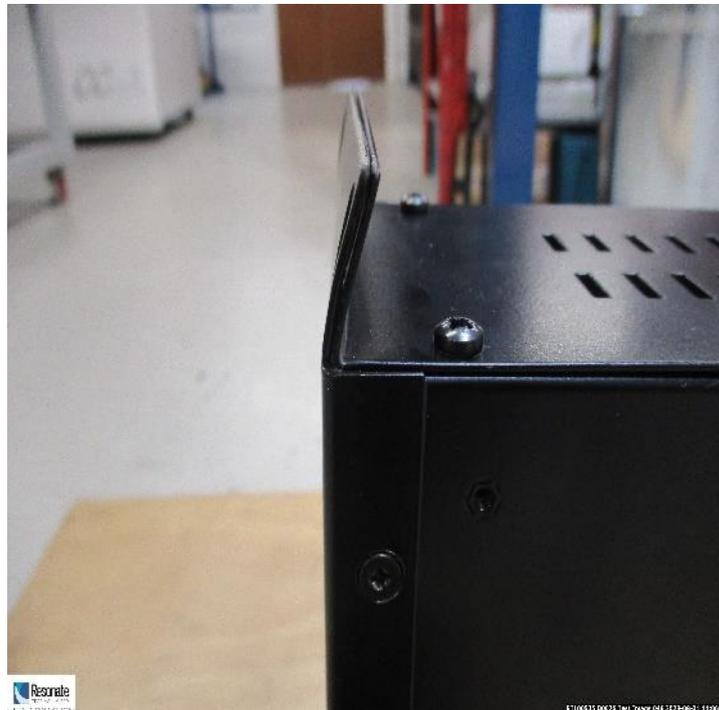


Figure 10: Observation after drop 4, Face 4, bending on front plate



Figure 11: Observation after drop 9, corner of transit case front plate bent further



Figure 12: Observation after drop 10, corner of transit case front plate bent further



Figure 13: Observation after drop 13, corner of transit case front plate bent further



Figure 14: Observation after drop 15, bowing of edge



Figure 15: Observation after drop 16, edge bowing outwards



Figure 16: Observation after drop 19, damage on impact edge



Figure 17: Observation after drop 23, Corner damage

 Resonate TESTING LIMITED A NACELLE GROUP COMPANY	Test Report Drop	Record No: RTL00535 D0026 Rev No: 1 2023-09-04 Document Status: Approved
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6 Quality Assurance

Our technical competence and quality control arrangements are in accordance with the conditions of our quality management system.

7 Summary

Drop tests were carried out in accordance with customer requirements. After each drop, a visual inspection was carried out by the customer witness.

Some bending of the transit case, on the corners and edges with bowing of each face was observed.

 <p>Resonate TESTING LIMITED A NACELLE GROUP COMPANY</p>	<p>Test Report Drop</p>	<p>Record No: RTL00535 D0026 Rev No: 1 2023-09-04 Document Status: Approved</p>
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End of Report

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