

परीक्षण रिपोर्ट

TEST REPORT

अहस्तांतरणीय

Non-Transferable






(विकासालक परीक्षण /Development Test)

परीक्षण रिपोर्ट संख्या
Test Report No. :

C D O G S 7 6 5 7

तिथि/ Date: 26.09.2023

- 1.0 ग्राहक का नाम और पता : M/s. TECHNO IMPRESSIONS PRIVATE LIMITED
NAME AND ADDRESS OF THE CUSTOMER 2B, 22/11, VST Apartments Padamugal, Kakkanad, Indira, Junction, Kalamassery, KOCHI-682030 Kerala INDIA
- 2.0 ग्राहक संदर्भ/CUSTOMER REFERENCE : CCDTCHNSH168512 dated 13-Jul-2023
- 3.0 परीक्षण के तहत उपकरण का विवरण (डीयूटी)
DESCRIPTION OF DEVICE UNDER TEST (DUT):
डीयूटी नाम /DUT Name: : "enso" Intelligent Headlight Beam Assist
भाग संख्या /Part No.: Mark II EMR
मात्रा /Quantity: 04Nos.
- 4.0 नमूना प्राप्ति की तिथि (डीयूटी)
DATE OF RECEIPT OF SAMPLE (DUT) : 30.07.2023
- 5.0 नमूना की स्थिति/CONDITION OF SAMPLE : No physical damage observed.
- 6.0 परीक्षण उद्देश्य/TEST OBJECTIVE : To carry out the test as mentioned in Sr. No. 12.0 of this report on the sample as mentioned in Sr. No. 3.0 above.
- 7.0 परीक्षण विधि/TEST METHOD : As per customer specification
- 8.0 कार्यात्मक सत्यापन
FUNCTIONAL VERIFICATION : Refer Annexure I of this test report.
- 9.0 परीक्षण विवरण /TEST DESCRIPTION : Tests(mentioned in Sr. No. 12.0) as per customer specification.
- 10.0 परीक्षण की प्रदर्शन के तिथि
DATE OF PERFORMANCE OF TEST : 31.07.2023 to 14.08.2023 (Go head on draft report received from customer on date 21.09.2023)
- 11.0 परीक्षण प्रेक्षण और परिणाम
TEST OBSERVATION AND RESULTS : Test observations/results & photographs are mentioned in Annexure – I of this test report.

Prepared By	Checked & Authorized By	Approved By	
			
SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	SONU KUMAR SUDRANIA Manager	
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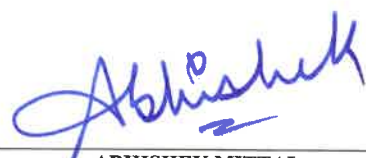
Date: 26.09.2023

12.0 TEST DETAILS:

Sr. No.	Test Description	ICAT Sample I.D	Reference Standard	Result/ Observation
1.	High Temperature Test	ICAT/EEL/168512/01	As Customer Specifications	<u>Annexure-I, Cl. No. 1.5</u>
2.	Low Temperature Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 2.5</u>
3.	Damp Heat Test	ICAT/EEL/168512/03		<u>Annexure-I, Cl. No. 3.5</u>
4.	Vibration Test	ICAT/EEL/168512/04		<u>Annexure-I, Cl. No. 4.6</u>
5.	Shock Test	ICAT/EEL/168512/04		<u>Annexure-I, Cl. No. 5.6</u>
6.	Dust Ingress Protection Test (IP4X)	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 6.5</u>
7.	Over Voltage Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 7.5</u>
8.	Slow Decrease And Increase Of Supply Voltage Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 8.5</u>
9.	Reversed Voltage Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 9.5</u>
10.	Ground Reference And Supply Offset Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 10.5</u>
11.	Insulation Resistance Test	ICAT/EEL/168512/03		<u>Annexure-I, Cl. No. 11.5</u>
12.	Short Circuit Test	ICAT/EEL/168512/02		<u>Annexure-I, Cl. No. 12.5</u>

13.0 CALIBRATION STATUS OF EQUIPMENTS/ INSTRUMENTS:

Sr. No.	Equipment/Instrument Name	Equipment Identification No.	Calibration Status
1	Temp. & Humidity Chamber	ICAT/EEL/CCC/10	09.02.2024
2	Temp. & Humidity Chamber	ICAT/EEL/CCC/11	22.02.2024
4	Regulated DC Power Supply	ICAT/EEL/NDCPS/05	07.07.2024
5	Regulated DC Power Supply	ICAT/EEL/NDCPS/06	07.07.2024
6.	Electrodynamic Vibration Test System		
6.1	Electrodynamic Shaker	ICAT/EEL/EDVS/01	19.01.2024
6.2	Vibration Controller	ICAT/EEL/VC/01	19.01.2024
6.3	Digital Switching	ICAT/EEL/DSPA/01	19.01.2024
6.4	Accelerometer	ICAT/EEL/ACC/02	20.11.2023

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 SHIKHA DIXIT Engineer Associate	 ABHISHEK MITTAL Deputy Manager	

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Date: 26.09.2023

Annexure-I

1. High Temperature Test as per customer specifications:

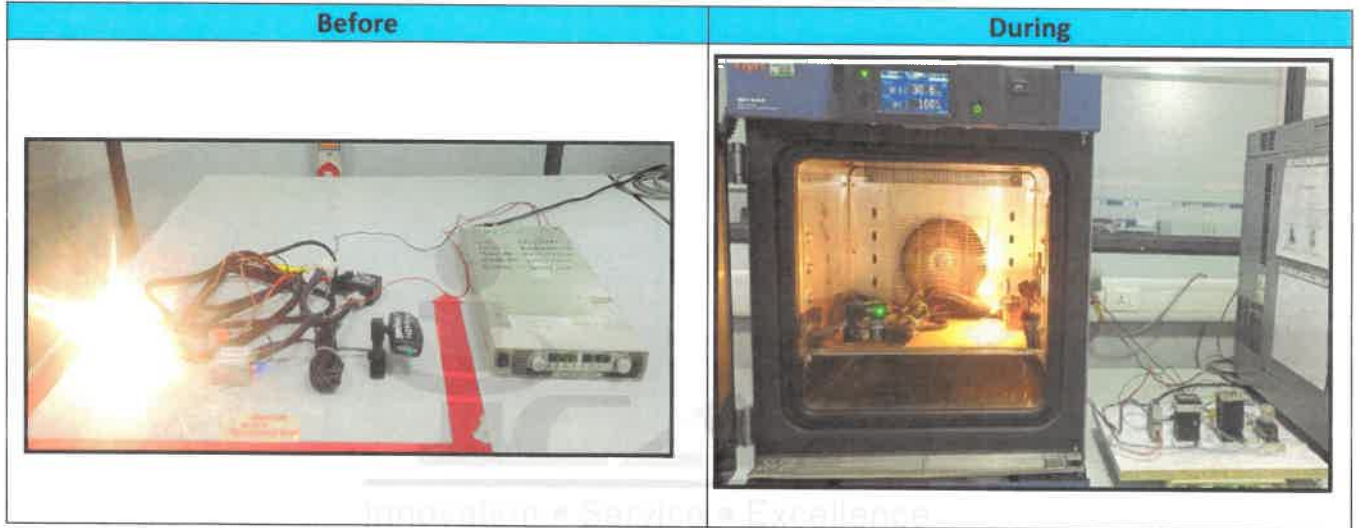
1.1 Test Conditions:




ICAT Sample I.D	ICAT/EEL/168512/01
DUT Operating Mode	Operating Mode (12VDC)

1.2 Test Specifications:

Temperature	+65°C
Operation cycle	1 min High Beam and 1min Low Beam
No. of Cycle	300
Duration	10Hrs

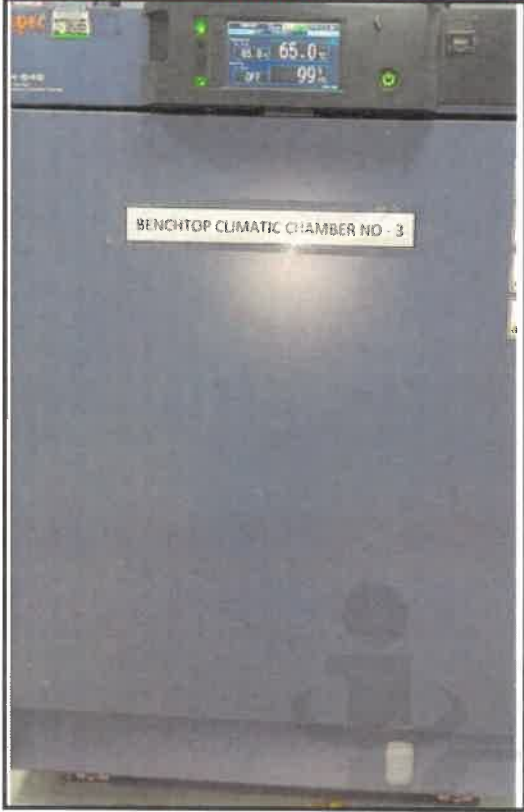
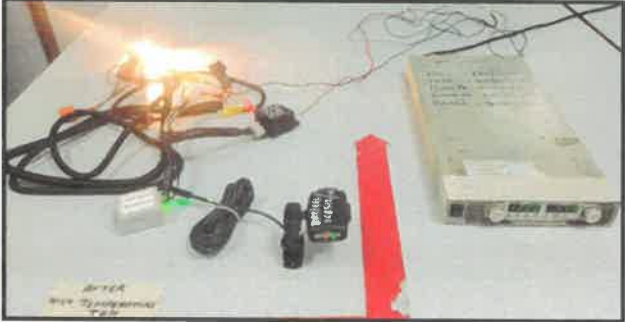
1.3 Test Photographs:



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Annexure-I (continued)

Test Photographs (continued):




During	After
	

1.4 Acceptance Criteria:

- There should not be any irregularity such as deformation, cracks, distortion after the test
- Sample should function properly during and after the test.

1.5 Test Observations/Results:

- **No physical damaged observed after the test.**
- **DUT working ok during and after the test.**

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Annexure-I (continued)

2. Low Temperature Test as per customer specifications:

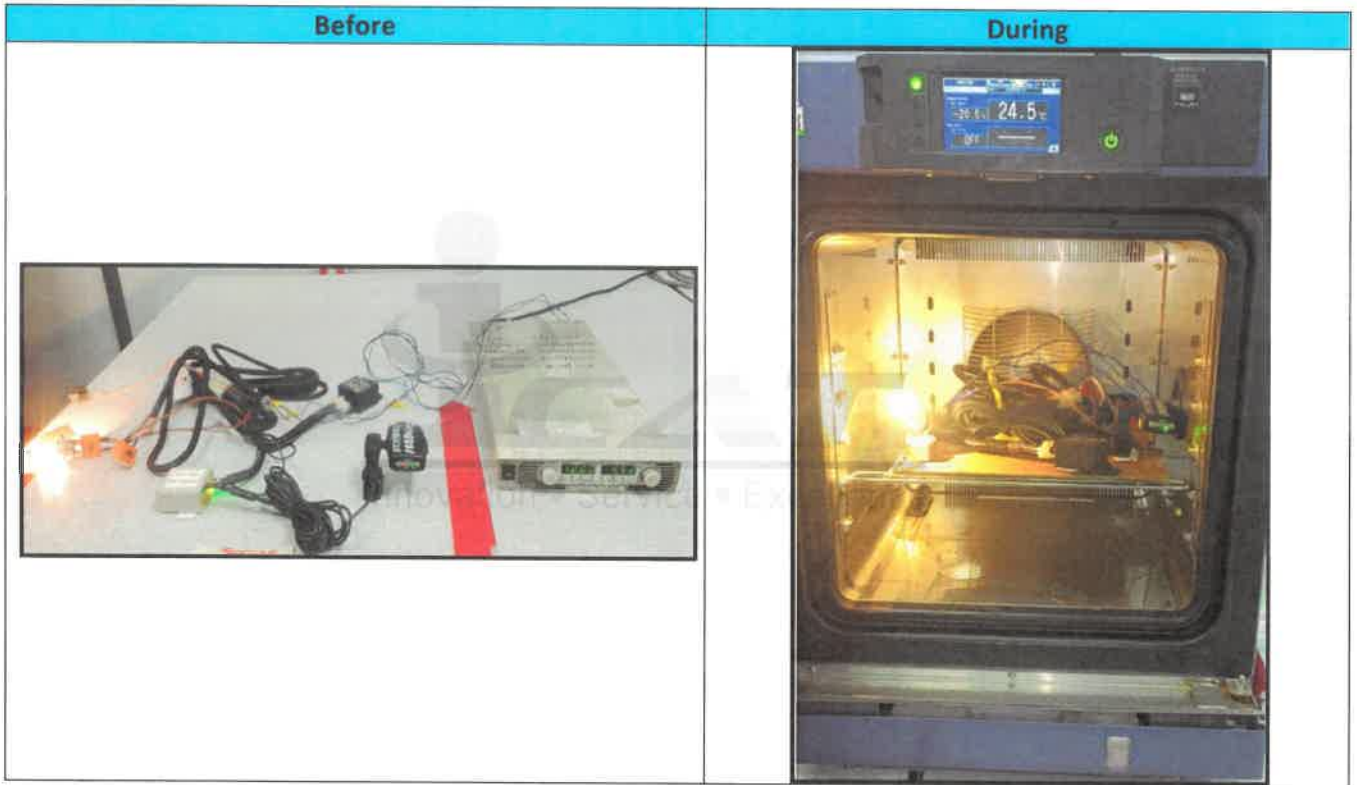
2.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode (12VDC)

2.2 Test Specifications:

Temperature	-20°C
Operation cycle	1 min High Beam and 1min Low Beam
No. of Cycle	300
Duration	10Hrs

2.3 Test Photographs:



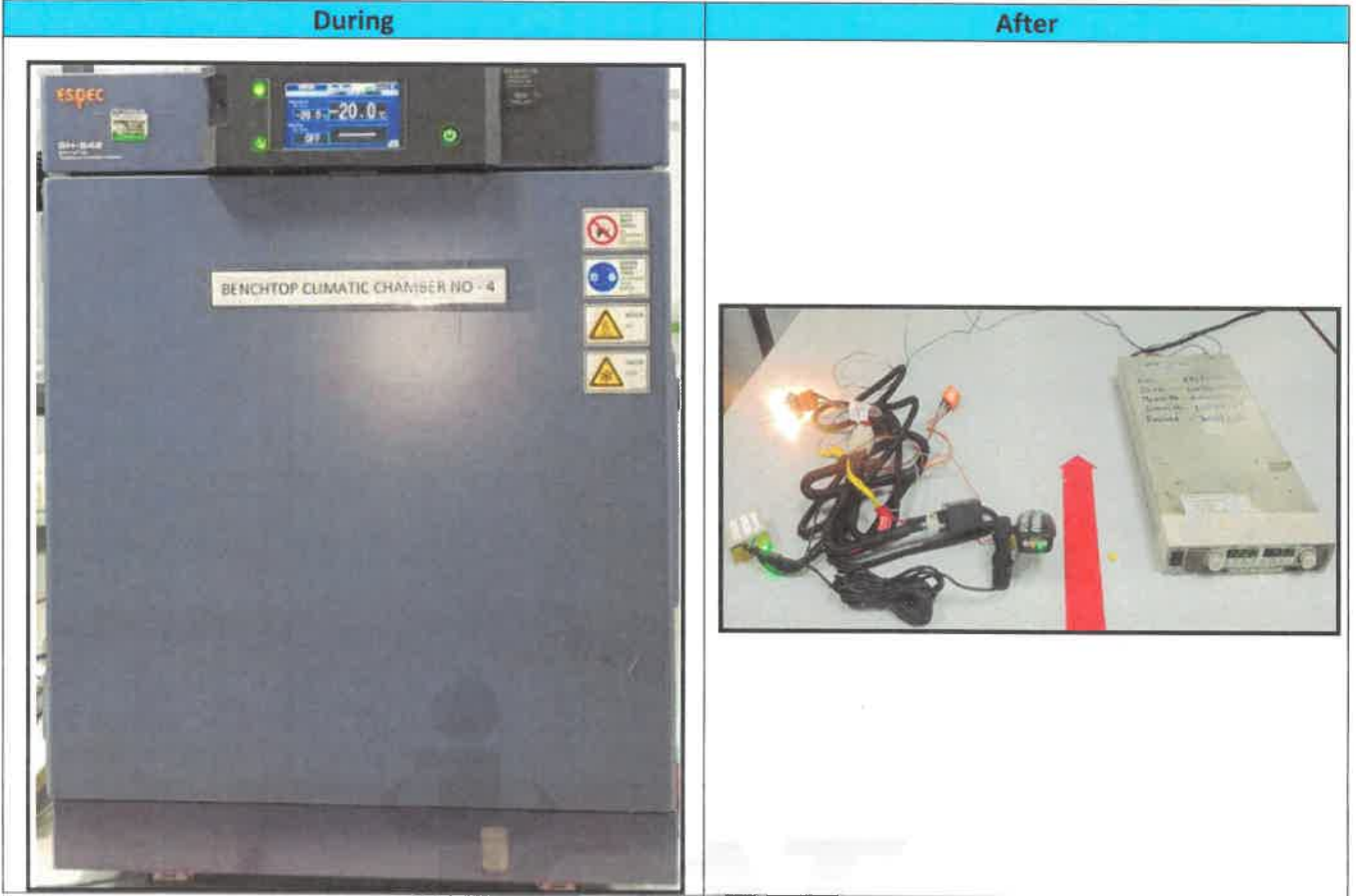
<p>Prepared By</p> <p style="font-size: 2em; color: blue;"><i>Shikha</i></p> <p>SHIKHA DIXIT Engineer Associate</p>	<p>Checked & Authorized By</p> <p style="font-size: 2em; color: blue;"><i>Abhishek</i></p> <p>ABHISHEK MITTAL Deputy Manager</p>	 <p>Page 5 of 27 [168512]</p>
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Annexure-I (continued)

Test Photographs (continued):






2.4 Acceptance Criteria:

- There should not be any irregularity such as deformation, cracks, distortion after the test
- Sample should function properly during and after the test.

2.5 Test Observations/Results:

- **No physical damaged observed after the test.**
- **DUT working ok during and after the test.**

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Annexure-I (continued)

3. Damp Heat Test as per customer specifications:

3.1 Test Conditions:




ICAT Sample I.D	ICAT/EEL/168512/03
DUT Operating Mode	Operating Mode (12VDC)

3.2 Test Specifications:

Temperature	+55°C
Humidity	97% RH
Duration of 1 thermal cycle	24 hours
No. of Cycle	6
Duration	144 hours

3.3 Test Photographs:



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Annexure-I (continued)

Test Photographs (continued):






3.4 Acceptance Criteria:

- There should not be any irregularity such as deformation, cracks, distortion after the test
- Sample should function properly during and after the test.

3.5 Test Observations/Results:

- ***No physical damaged observed after the test.***
- ***DUT working ok during and after the test.***

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<p>SHIKHA DIXIT Engineer Associate</p>	<p>ABHISHEK MITTAL Deputy Manager</p>	
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Annexure-I (continued)

4. Vibration Test as per customer specifications:

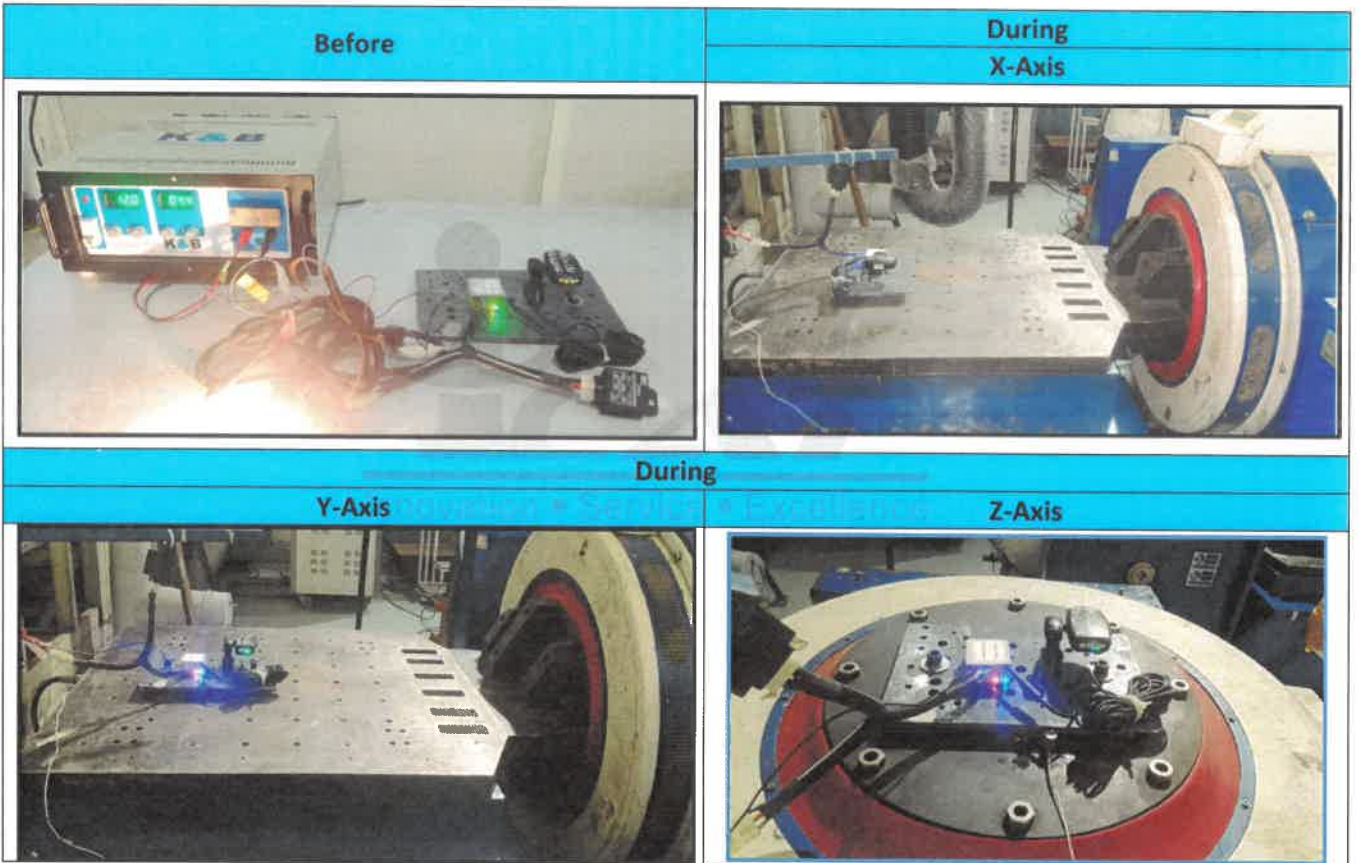
4.1 Test Conditions:



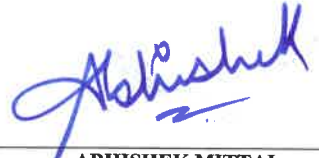
ICAT Sample I.D	ICAT/EEL/168512/04
DUT Operating Mode	Operating Mode (12VDC)

4.2 Test Specifications:

Frequency (Hz)	Displacement (mm)	Acceleration (g)	Duration Each Axis (hrs)	Total Duration (hrs)	Axis
10-24	0.2	-	1	3	X
24-1000	-	2.5			Y
					Z

4.3 Test Photographs:



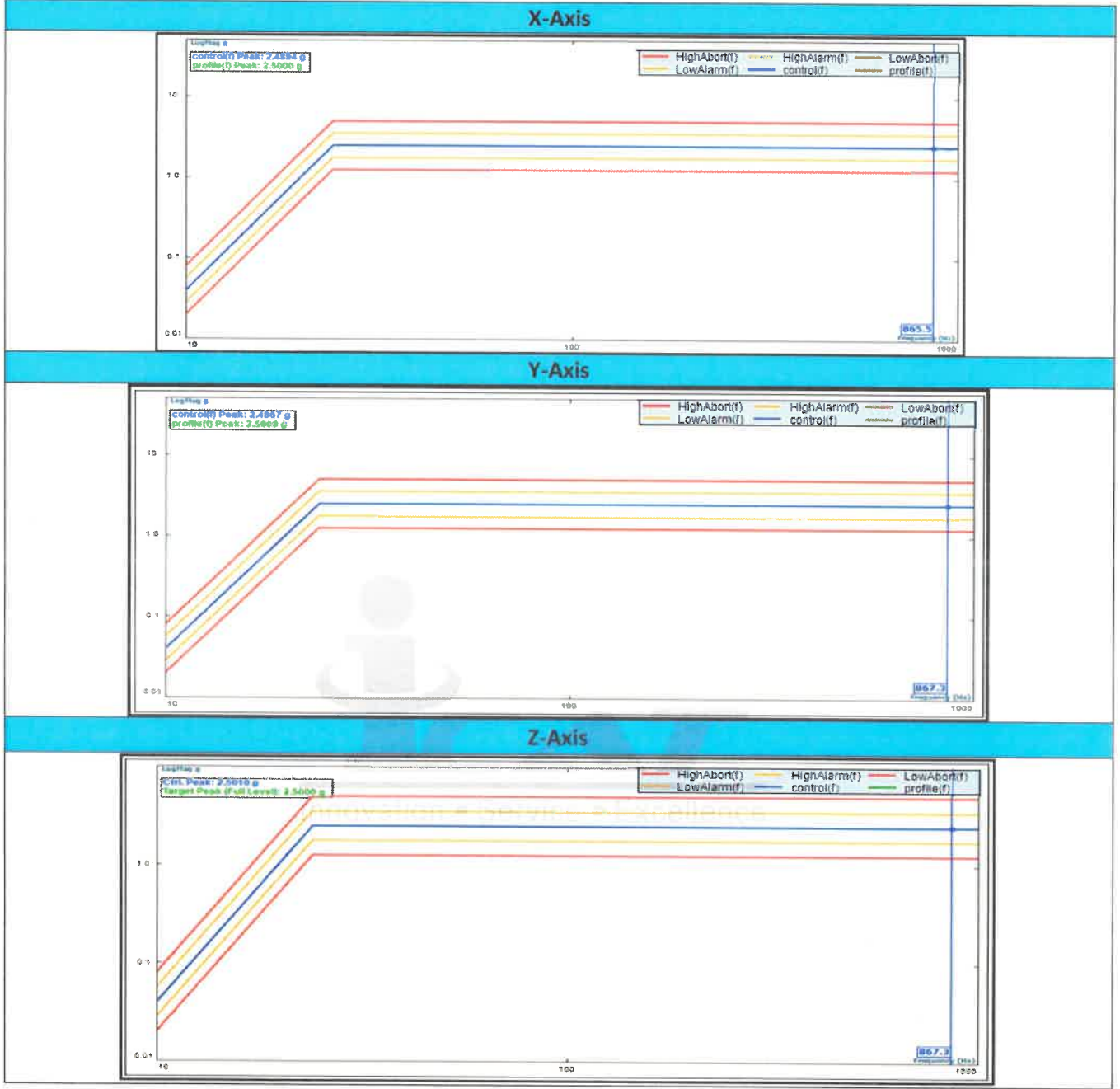
Prepared By	Checked & Authorized By	 <p>INTERNATIONAL CENTRE FOR AUTOMOTIVE TECH</p> <p>MANESAR</p>
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Annexure-I (continued)

4.4. Test Graphs:



<p>Prepared By</p> <p><i>Shikha</i></p>	<p>Checked & Authorized By</p> <p><i>Abhishek</i></p>	 <p>INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY MANESAR</p>
<p>SHIKHA DIXIT Engineer Associate</p>	<p>ABHISHEK MITTAL Deputy Manager</p>	

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Annexure-I (continued)




4.5 Acceptance Criteria:

- There should not be any irregularity such as deformation, cracks, distortion after the test
- Sample should function properly during and after the test.

4.6 Test Observations/Results:

- No physical damaged observed after the test.
- DUT working ok during and after the test.



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Annexure-I (continued)

5. Shock Test as per customer specifications:

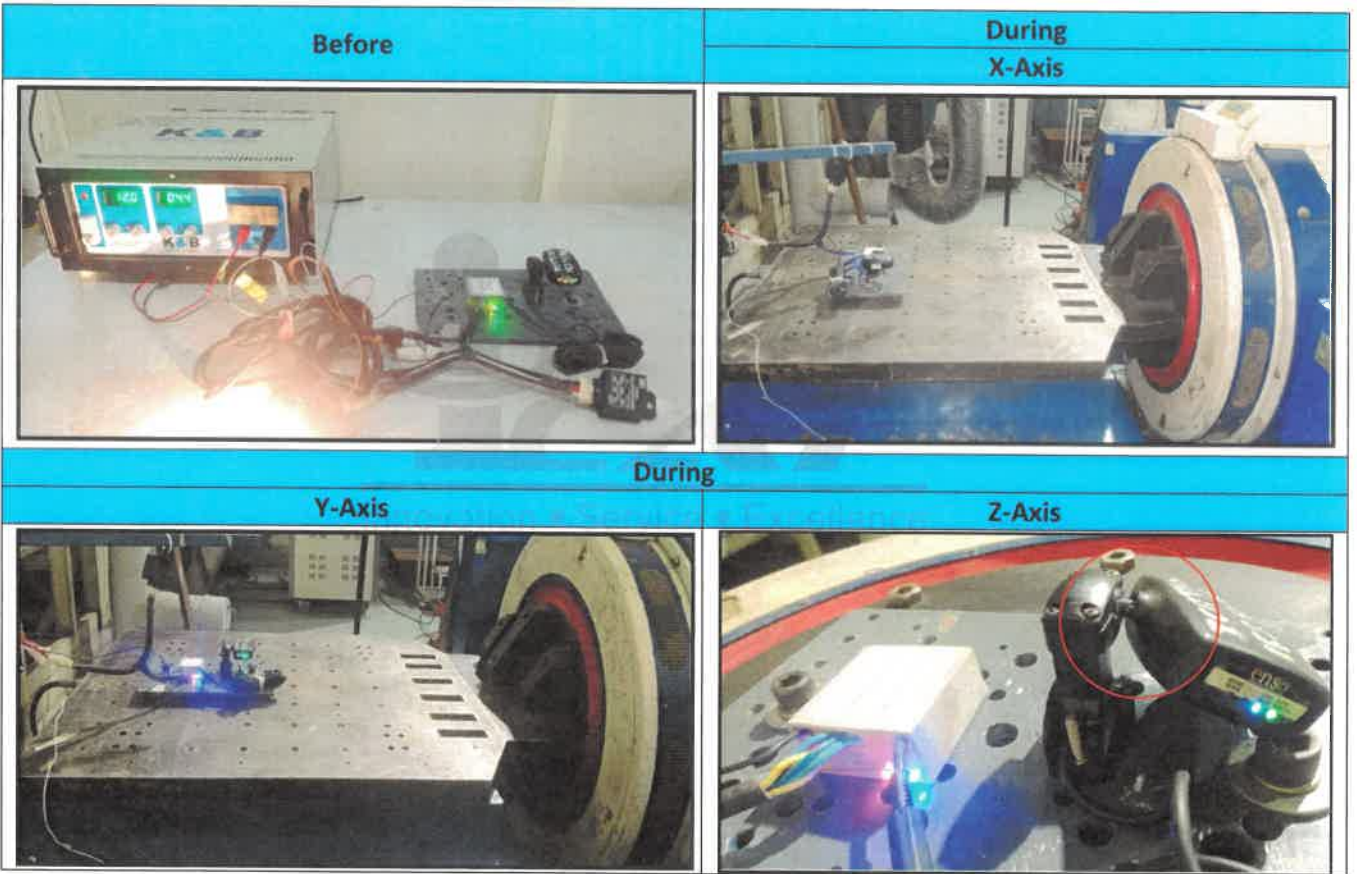
5.1 Test Conditions:




ICAT Sample I.D	ICAT/EEL/168512/04
DUT Operating Mode	Operating Mode (12VDC)

5.2 Test Specifications:

No. of Bump	1000
Pulse duration	6ms
Acceleration	40g
Axis	X,Y and Z

5.3 Test Photographs:



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Annexure-I (continued)



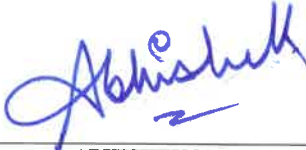
5.4 Acceptance Criteria:

- There should not be any irregularity such as deformation, cracks, distortion after the test
- Sample should function properly during and after the test.

5.5 Test Observations/Results:

- ***During Z-Axis in negative shock after 10 shock, DUT broken.***
- ***DUT working ok during and after the test.***



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SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	

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Annexure-I (continued)

6. Dust Ingress Protection Test (IP4X) as per Customer Specifications refer from IEC 60529:2013:

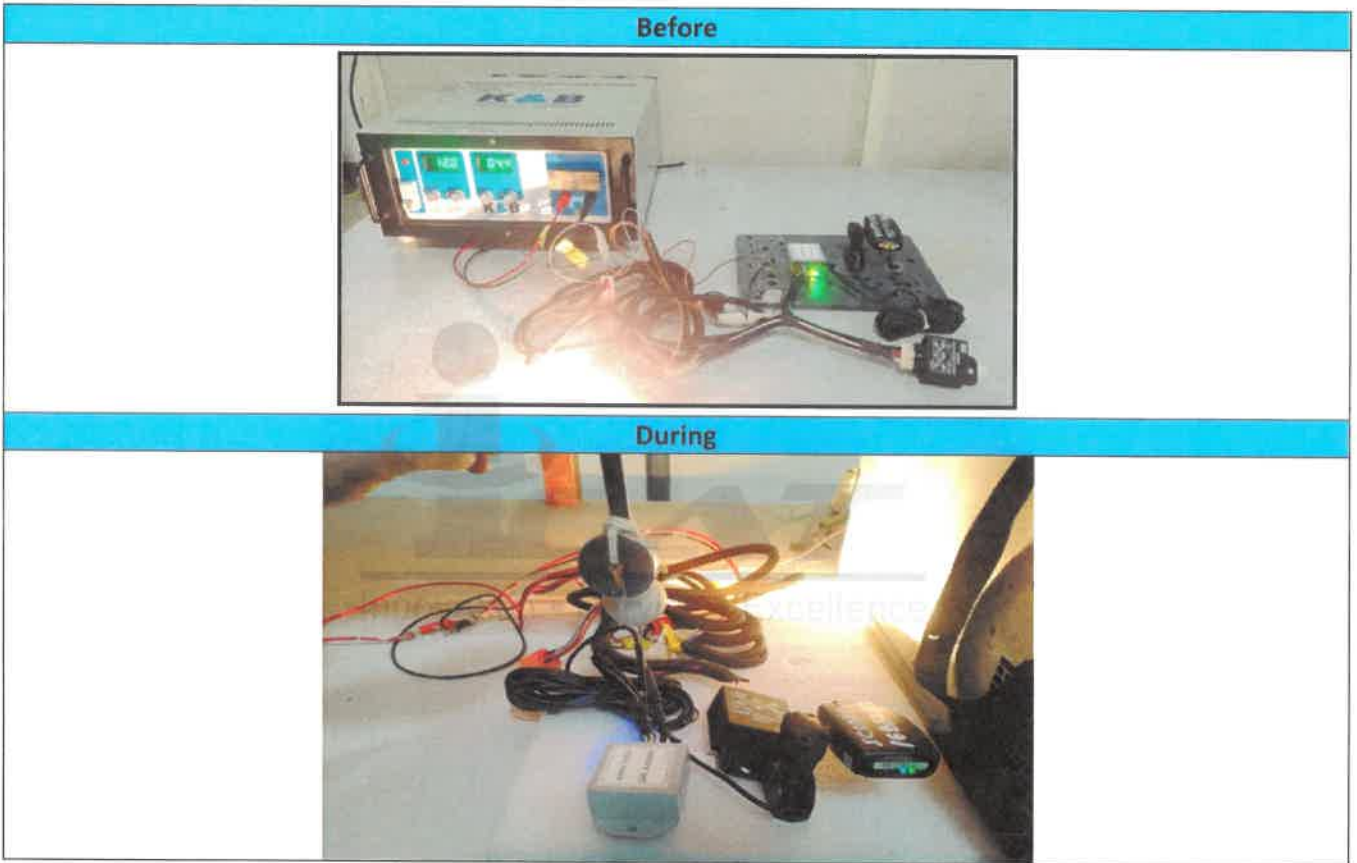
6.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

6.2 Test Specifications:

The object probe is pushed into the sample with Force	1N±10%
External object probe diameter	1.0mm

6.3 Test Photographs:



<p>Prepared By</p> <p style="font-size: 2em; color: blue;"><i>Shikha</i></p> <p>SHIKHA DIXIT Engineer Associate</p>	<p>Checked & Authorized By</p> <p style="font-size: 2em; color: blue;"><i>Abhishek</i></p> <p>ABHISHEK MITTAL Deputy Manager</p>	 <p>Page 14 of 27 [168512]</p>
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Annexure-I (continued)



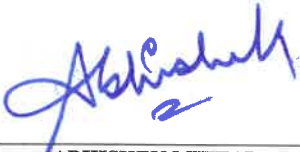
6.4 Acceptance Criteria:

- Complete Wire should not penetrate into the sample.
- Sample should function properly after the test.

6.5 Test Observations/Results:

- ***Functionality was satisfactory after the test.***
- ***No Wire penetration was observed inside the sample.***



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Annexure-I (continued)

7. Overvoltage Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.3:

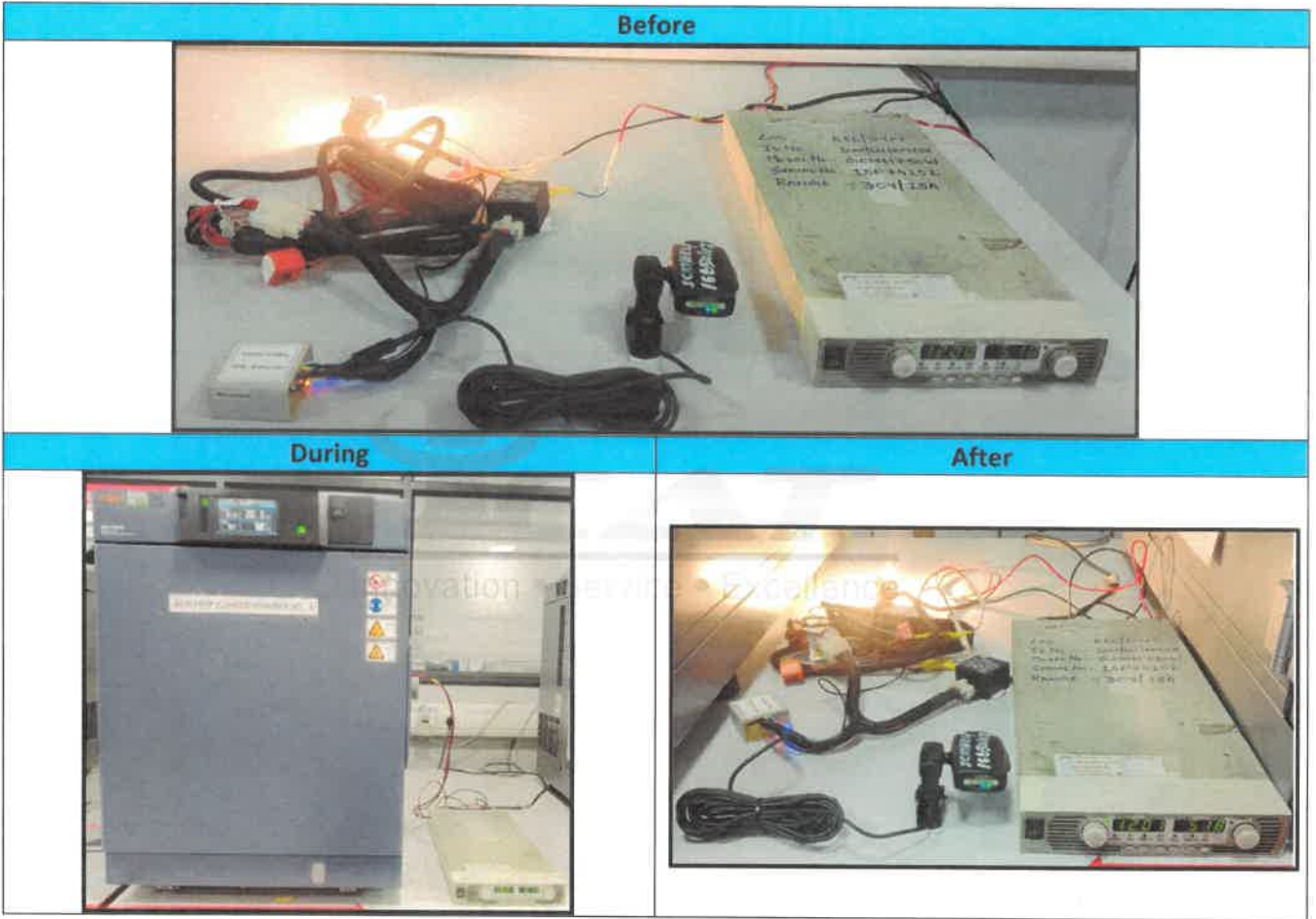
7.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

7.2 Test Specifications:

Test Voltage	18VDC
Test Duration	60min.

7.3 Test Photographs:



<p>Prepared By</p> <p style="font-size: 2em; color: blue;"><i>Shikha</i></p> <p>SHIKHA DIXIT Engineer Associate</p>	<p>Checked & Authorized By</p> <p style="font-size: 2em; color: blue;"><i>Abhishek</i></p> <p>ABHISHEK MITTAL Deputy Manager</p>	 <p>Page 16 of 27 [168512]</p>
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Annexure-I (continued)




7.4 Acceptance Criteria:

- There should not be harmful effects to the sample during and after the test.
- Sample should be functional after the test-CLASS C.

7.5 Test Observations/Results:

- ***Functionality was OK after the test.-CLASS A***
- ***No harmful effect observed during and after the test.***



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SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	

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Annexure-I (continued)

8. Slow Decrease and Increase of Supply Voltage Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.5:

8.1 Test Conditions:



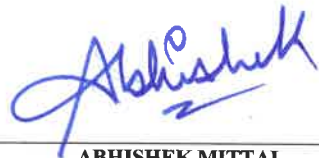
ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

8.2 Test Specifications:

Apply the following test simultaneously to all applicable inputs (connections) of the DUT.
 Decrease the supply voltage from the minimum supply voltage, U_{Smin} to 0 V, then increase it from 0 V to U_{Smin} , applying a change rate of (0.5 ± 0.1) V/min linear, or in equal steps of not more than 25 mV.

8.3 Test Photographs:



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Annexure-I (continued)


8.4 Acceptance Criteria:

- There should not be harmful effects to the sample during and after the test.
- Sample should be functional after the test-CLASS C.

8.5 Test Observations/Results:

- **Functionality was OK after the test.-CLASS C**
- **No harmful effect observed during and after the test.**



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<i>Shikha</i>	<i>Abhishek</i>	
SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	

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Annexure-I (continued)

9. Reverse Voltage Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.7:

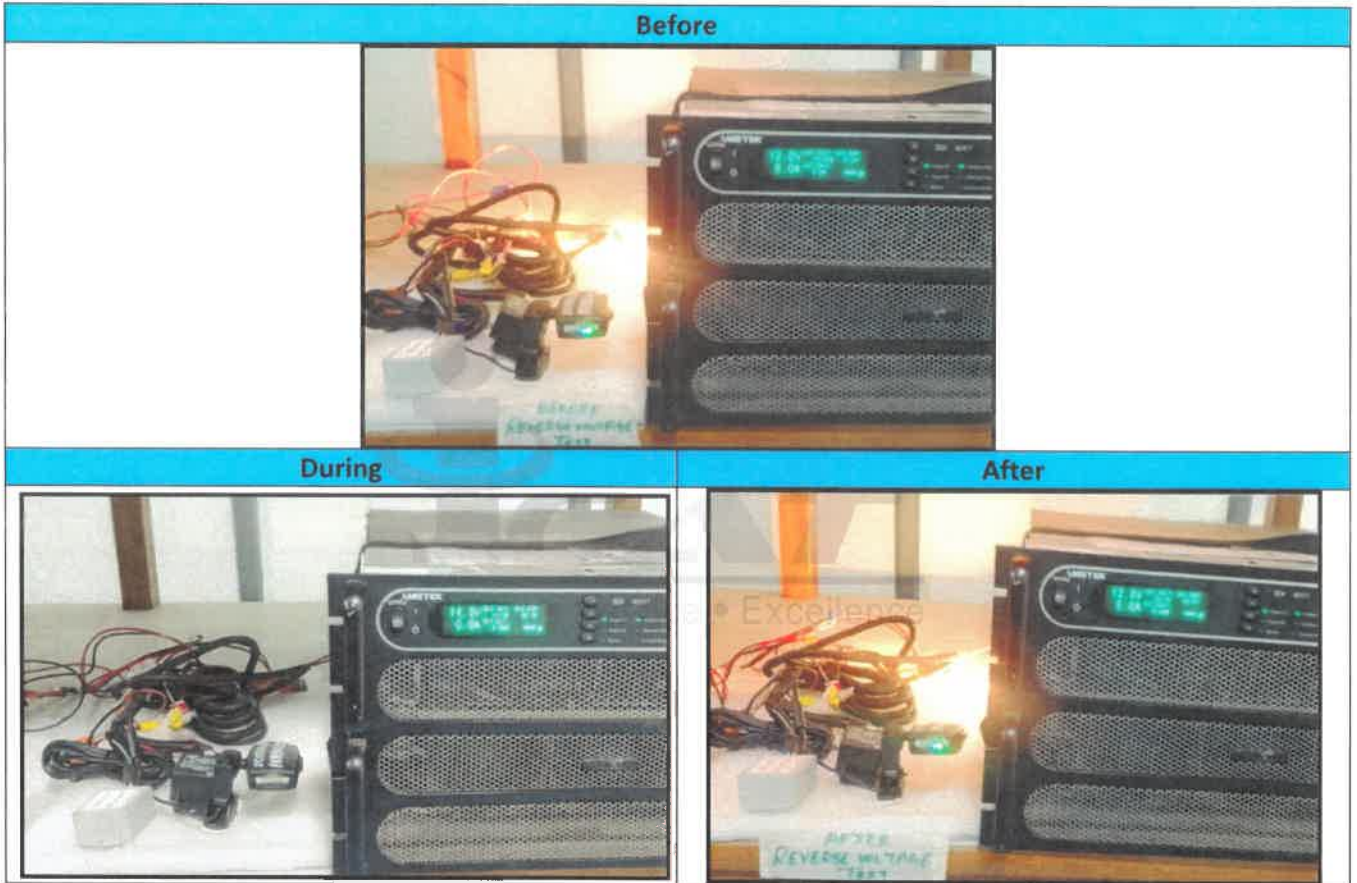
9.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

9.2 Test Specifications:

Test Voltage	14VDC
Duration	60sec

9.3 Test Photographs:



<p>Prepared By</p> <p style="font-size: 2em; color: blue;"><i>Shikha</i></p> <p>SHIKHA DIXIT Engineer Associate</p>	<p>Checked & Authorized By</p> <p style="font-size: 2em; color: blue;"><i>Abhishek</i></p> <p>ABHISHEK MITTAL Deputy Manager</p>	 <p>Page 20 of 27 [168512]</p>
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Annexure-I (continued)


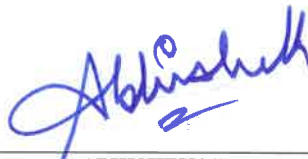

9.4 Acceptance Criteria:

- Sample should be functional after the test-CLASS A.

9.5 Test Observations/Results:

- Functionality was OK after the test.-CLASS A



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Annexure-I (continued)

10. Ground reference and supply offset Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.8:

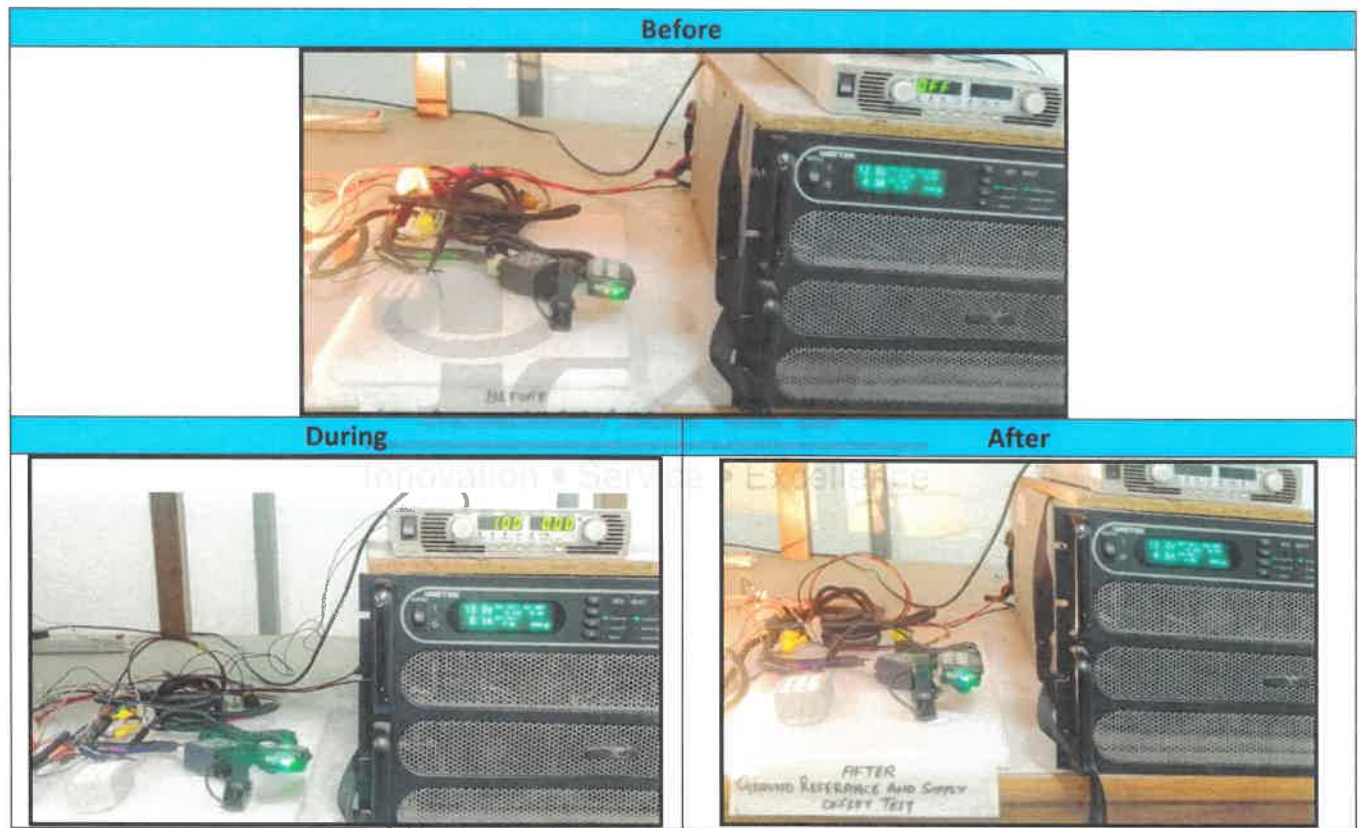
10.1 Test Conditions:




ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

10.2 Test Specifications:

For all DUTs, the offset voltage shall be (1.0 ± 0.1) V.
 a) Apply 14V (For 12V system) to the DUT.
 b) Subject ground/supply line to the offset voltage relative to the DUT ground/supply line.
 c) Perform a functional test under this condition.
 d) Repeat step c) for each next ground/supply line combination.
 Repeat the test with reverse offset voltage.

10.3 Test Photographs:



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Annexure-I (continued)




10.4 Acceptance Criteria:

- | |
|---|
| <ul style="list-style-type: none"> • Sample should be functional after the test-CLASS A. • There should not be any malfunction during and after the test. |
|---|

10.5 Test Observations/Results:

- | |
|---|
| <ul style="list-style-type: none"> • <u>Functionality was OK after the test.-CLASS A.</u> • <u>No Malfunction observed during and after the test.</u> |
|---|



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Annexure-I (continued)

11. Insulation Resistance Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.12:

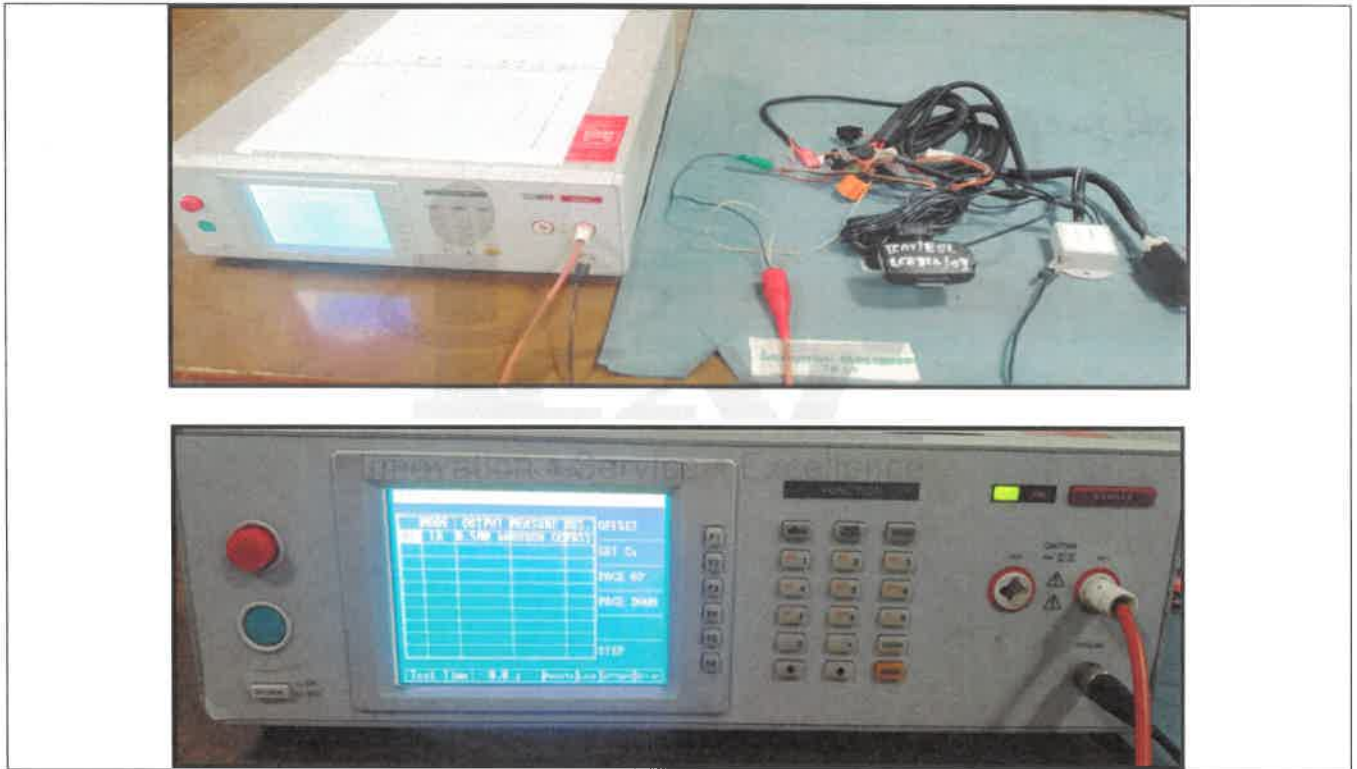
11.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/03
DUT Operating Mode	Non-Operating Mode
This test was performed post Damp Heat Cyclic Test after keeping the DUT at room temperature for 0.5 h.	

11.2 Test Specifications:

Applied Voltage	500V DC to DUT – Terminals with galvanic isolation; – Terminals and housing with electrically conductive surface with galvanic isolation; – Terminals and an electrode wrapped around the housing (e.g. metal foil) in the case of plastic material housing.
Duration	60 Sec.

11.3 Test Photographs:



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<i>Shikha</i>	<i>Abhishek</i>	
SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	

Annexure-I (continued)



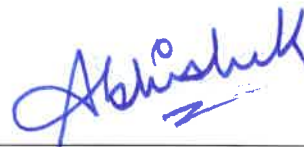
11.4 Acceptance Criteria:

- The insulation resistance shall be greater than 10 MΩ.

11.5 Test Observations/Results:

- *Insulation Resistance measured is greater than 10 MΩ.*



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Annexure-I (continued)

12. Short Circuit Protection Test as per as per Customer Specifications refer from ISO 16750-2:2010 Cl. No. 4.10:

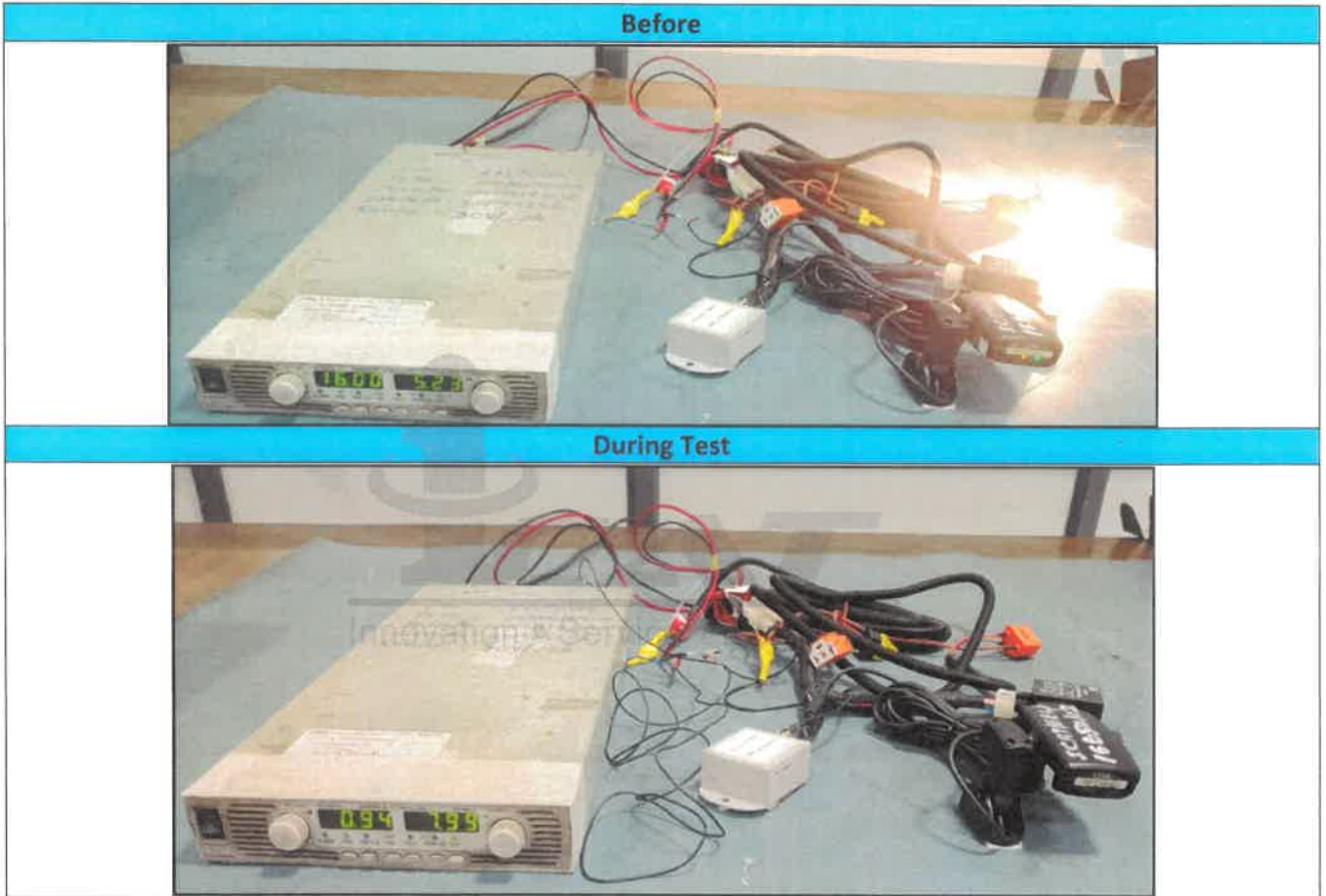
12.1 Test Conditions:


ICAT Sample I.D	ICAT/EEL/168512/02
DUT Operating Mode	Operating Mode

12.2 Test Specifications:

Applied Voltage	16V (for 12V System)
Duration	(60 ± 6) s

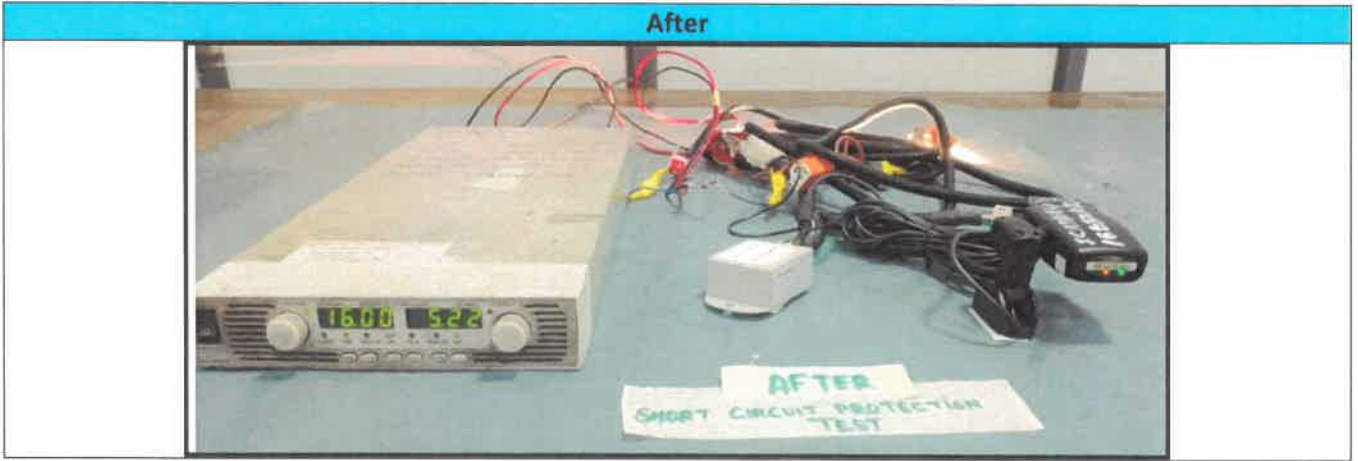
12.3 Test Photographs:



Prepared By	Checked & Authorized By	
<i>Shikha</i>	<i>Abhishek</i>	
SHIKHA DIXIT Engineer Associate	ABHISHEK MITTAL Deputy Manager	

Annexure-I (continued)

12.3 Test Photographs:





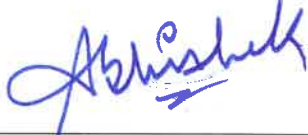
12.4 Acceptance Criteria:

- The functional status shall be minimum class C.

12.5 Test Observations/Results:

- Functionality was ok after the test-CLASS C.



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