

# INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

[A Division of NATRIP Implementation Society (NATIS), Govt. of India]

Non-Transferable

## TEST REPORT

C T O C K 2040

Date: 15.07.2015

- 1.0 **NAME AND ADDRESS OF THE: CUSTOMER** M/s Computech Systems,  
G-4, Harsha House,  
Karampura complex,  
New Delhi-110015, India
- 2.0 **NAME AND ADDRESS OF THE: MANUFACTURER** M/s Anhui Xinneng Power Technology Co., Ltd  
Tianying Industrial District,  
Jieshou City, Anhui Province,  
China
- 3.0 **CUSTOMER LETTER REF:** IOCS No. CCTNCOMSK06T39626 dated 04-Jun-2015





- 4.0 **DESCRIPTION OF DEVICE UNDER TEST (DUT):**  
 DUT Name : Battery Module 12 Volts DC  
 Battery Type : Sealed Lead Acid  
 Battery Capacity(Ah) : 24 Ah (Ah in 5 hrs)  
 Battery Energy(kWh) : 0.24 kWh  
 Id/Model No. : CS1224  
 Quantity : 06 Nos. (ICAT/AEEL/39626/01-06)



- 5.0 **OBJECTIVE OF THE TEST:**  
To validate the Safety Requirements of Traction Batteries as per AIS: 048 published in 2009.
- 6.0 **TEST RESULTS:** Innovation • Service • Excellence  
Please refer the Test requirements and Results in Annexure-I of this report.
- 7.0 **CONCLUSION:**  
The battery specified in Sr. No. 4.0 of this test report met all the test requirements when tested as per AIS: 048 published in March 2009.

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 <b>DEVESH PAREEK</b> Asst. Manager	 <b>PRITAM SINGH</b> Manager		 <b>Madhusudan Joshi</b> Asst. Gen Manager	


Innovation • Service • Excellence

Annexure – I





1.0 TEST REQUIREMENTS AND RESULTS:

Cl. No.	Test	Test Requirements	Observations/Results
<b>2.1 Electrical Tests</b>			
2.1.1	<p><b>Short Circuit test</b> (Test ID:ICAT/AEEL/39626/06)</p>	 <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature. Apply a hard short in less than one second to the battery module with a conductor specified in the standard. Test Duration: 10 minutes, or until another condition occurs which prevents completion of test (i.e. component melting, etc.) Lab temperature: Not exceeding 30°C</p> <p><b>Acceptance Criteria:</b> Excellence After 2 hours of observation: At the end of the test, there shall be no: a) Physical damage to the casing or mechanical parts. b) Melting of components. c) Fire or explosion. It is acceptable for the battery to become dry at the end of the test.</p>	<p>Ambient temperature: 29°C.</p> <p>Conductor of <math>\leq 5m\Omega</math> was used and short was applied for 10 minutes.</p> <p>No physical damage, explosion or melting observed.</p> <p><b>Satisfactory.</b></p>

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 <b>DEVESH PAREEK</b> Asst. Manager	 <b>PRITAM SINGH</b> Manager		 <b>Madhusudan Joshi</b> Asst. Gen Manager	

<p>2.1.2</p>	<p><b>Over Charge test</b> (Test ID:ICAT/AEEL/39626/02)</p>	<div style="text-align: center;">  </div> <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature at <math>27 \pm 5^{\circ}\text{C}</math>. Duration: 10 hours The battery is to be overcharged at a constant charging current of 0.1 (<math>C_{10}</math>).</p> <p><b>Acceptance Criteria:</b> At the end of the test, there shall be no: a) Physical damage to the casing or other mechanical parts. b) Melting of components. c) Fire or explosion.</p>	<p>Battery was charged with 2.6 A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p><b>Satisfactory.</b></p>
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<p><b>DEVESH PAREEK</b> Asst. Manager</p>	<p><b>PRITAM SINGH</b> Manager</p>		<p><b>Madhusudan Joshi</b> Asst. Gen Manager</p>	

2.2 Mechanical Tests

2.2.1

**Vibration test**  
(Test ID: ICAT/AEEL/39626/03)



Battery Condition: Fully charged (100% SOC), contained at ambient temperature, firmly held on the vibration table in vehicle mounting position.  
 Axis: Vertical and Horizontal axis, with battery positioned in longitudinal direction.  
 Acceleration: 3 g (sinusoidal vibration)  
 Frequency: 30-150 Hz  
 Sweep rate: 1 octave per minute  
 Duration: 2 hours in each axis  
 Immediately after the test, discharge the battery at room temperature not exceeding 30°C, at the rate of  $I = 0.2 \times \text{Battery capacity}(C_5)$





**Acceptance Criteria:**  
 During test, there shall be no electrolyte loss. The deterioration of battery rated capacity during discharging shall not be more than 10%.  
 At the end of the test, there shall be no:  
 a) Physical damage to the casing or other mechanical parts  
 b) Fire or explosion.



No electrolyte loss observed during test.





Immediately after the test, battery was discharged at 4.8A And deterioration observed was not more than 10%.



No physical damage or explosion observed.




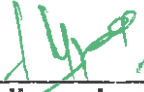
**Satisfactory.**

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<b>DEVESH PAREEK</b> Asst. Manager	<b>PRITAM SINGH</b> Manager		<b>Madhusudan Joshi</b> Asst. Gen Manager	

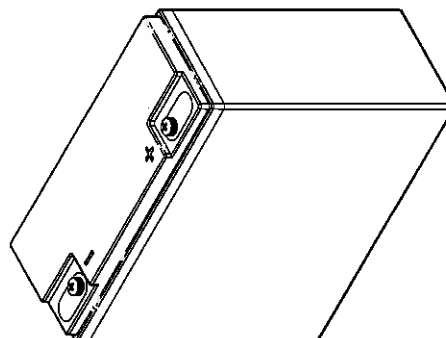
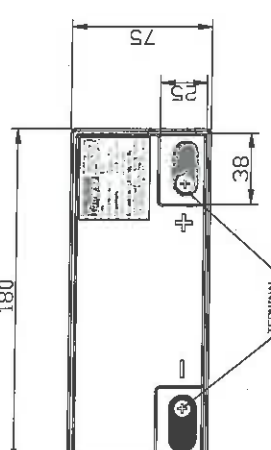
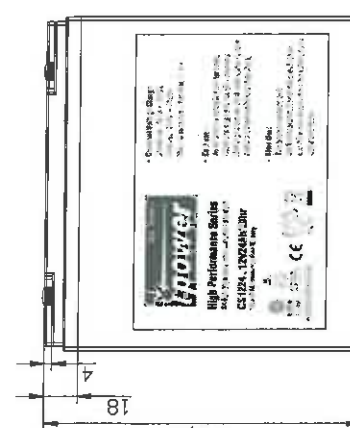
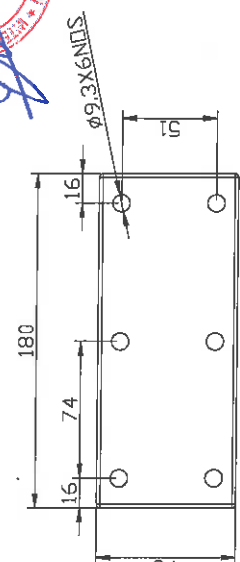
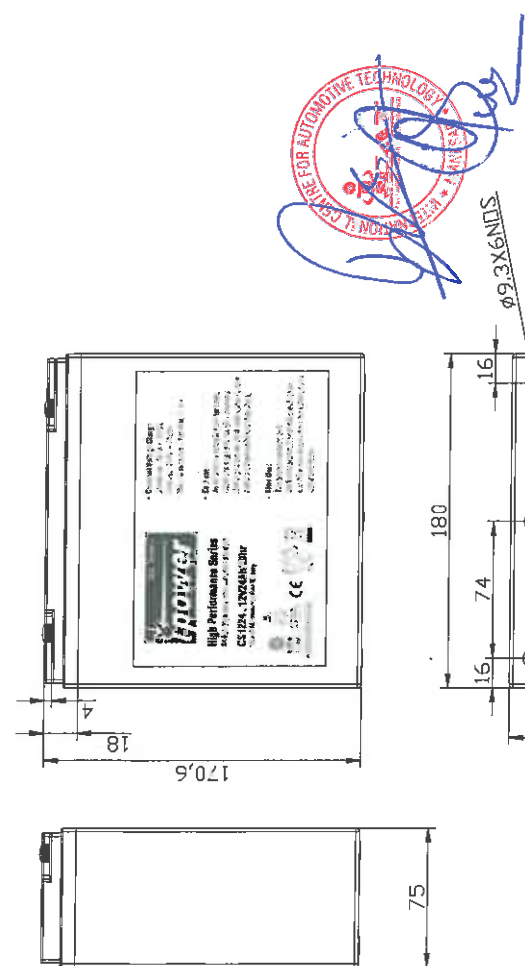
<p>2.2.2</p>	<p><b>Shock test</b> (Test ID: ICAT/AEEL/39626/05)</p>	  <p>Battery Condition: Fully charged (100% SOC), contained at ambient temperature not exceeding 30°C, firmly held on the vibration table in vehicle mounting position.              Axis: Vertical and Horizontal axis, with battery positioned in longitudinal direction.              Acceleration: 30 g (half-sine wave)              No. of shocks: 10 in each axis              Duration: 15 ms of each shock</p> <p>Immediately after the test, discharge the battery at room temperature, at the rate of <math>I = 0.2 \times \text{Battery capacity}(C_5)</math></p> <p><b>Acceptance Criteria:</b>              The deterioration of battery rated capacity during discharging shall not be more than 10%.              At the end of the test, there shall be no:              a) Physical damage to the casing or other mechanical parts              b) Fire or explosion.</p>	<p>Immediately after the test, battery was discharged at 4.8 A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p><b>Satisfactory.</b></p>
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<p>2.2.3</p>	<p><b>Roll-Over Test (Battery Module)</b> (TestID:ICAT/AEEL/39626/01)</p>	 <p>Rotate the battery module one complete revolution in one direction, for one minute in a continuous, slow-roll fashion, and observe leakage, if any. Then rotate the battery module in 90° increments in same direction for one full revolution. Hold the battery module for one hour at each position.</p> <p><b>Acceptance Criteria:</b> The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	<p>Spillage observed was less than 25ml in each position.</p> <p><b>Satisfactory.</b></p>
<p>2.2.4</p>	<p><b>Penetration Test</b> (TestID:ICAT/AEEL/39626/04)</p>	 <p>The battery module shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture. Rate of penetration: 8 cm/s. Diameter of Rod: 20mm Orientation of penetration: <b>perpendicular to the electrode plates.</b> Minimum Depth of penetration: <b>Through three cells or 100 mm</b> The battery should be observed, with the rod remaining in place, for a minimum of one hour after the test.</p> <p><b>Acceptance Criteria:</b> At the end of the test, there shall be no: a) Melting of components. b) Fire or explosion.</p>	<p>After penetration, up to a depth through three cells with a pointed mild steel rod of diameter 20mm, electrically insulated from the test fixture, no explosion, no fire and no melting observed.</p> <p><b>Satisfactory.</b></p>

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 <p><b>DEVESH PAREEK</b> Asst. Manager</p>	 <p><b>PRITAM SINGH</b> Manager</p>		 <p><b>Madhusudar Joshi</b> Asst. Gen Manager</p>	

RP No: CTCK9040

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A	REV. No.	NO. OF PLACE	MODIFICATION NO.	APPD. BY	DATE								
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<p><b>COMPUTECH SYSTEMS</b> G-4, Harsha House, Karampura Complex DELHI 110015</p>			<p>PART NO.- CS1224</p>	<p>SCALE NTS</p>	<p>DATE 13/07/2015</p>								
<p>CAPACITY :- 12VOLT 24Ah/C20</p>			<p>BRAND :- ipower</p>										
<p>MATERIAL USED : SEE NOTES</p>													