

# INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

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

Non-Transferable

## TEST REPORT

ULR No.: TC536019010000095P  
Test Report No.: C T O B O 5 2 0 6

Date: 19.08.2019

- 1.0 NAME AND ADDRESS OF THE CUSTOMER : M/s. IPOWER TECHNOLOGIES PVT. LTD.,  
G-4, Harsha House, Karampura Commercial Complex, New Delhi-110015, India
- 1.1 NAME AND ADDRESS OF THE MANUFACTURER : M/s. HONG KONG YAHENG POWER TECH. CO. LTD.,  
City, 17 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong
- 2.0 CUSTOMER LETTER REF : IOCS No. CCDIPTLOGEEL70364 Dated 28-June-2019

### 3.0 DESCRIPTION OF DEVICE UNDER TEST (DUT):

DUT Name	Battery Pack, 12 V
Battery Type	Lead Acid Battery
Battery Capacity(Ah)	33Ah (Ah in 5 hrs)
Rated Voltage	12 V DC
Id/Model No.	CS 1233
Quantity	06 Nos. of Battery Pack (ICAT/EEL/70364/01-06)
Trade Name	IPOWER
Drawing No.	201908001



4.0 DATE OF RECEIPT OF SAMPLE : 29.07.2019

5.0 CONDITION OF SAMPLE: No physical damage observed.

### 6.0 TEST OBJECTIVE:

To validate the Safety Requirements of Traction Battery as per AIS:048 as amended upto date.

7.0 TEST METHOD: Test method referred from AIS:048 as amended upto date.

8.0 FUNCTIONAL VERIFICATION: Functional verification done and battery was found satisfactory.


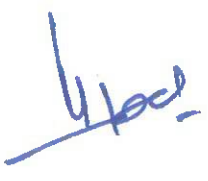
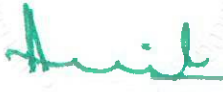
9.0 CONCLUSION: The battery specified in Sr.No.3.0 of this test report met all the test requirements when tested as per AIS:048 as amended upto date as mentioned in Annexure-I of this report.

10.0 TEST DESCRIPTION: Please refer the Annexure-I of this report.

11.0 DATE OF PERFORMANCE OF TEST: Please refer the Annexure-I of this report.

### 12.0 TEST RESULTS:

Please refer the Test requirements and Results in Annexure-I of this report.




ppPrepared By	Checked By	Approved By
		
UDIT KAUL Dy. Manager	MAHENDAR PAL Asst. General Manager	PAMELA TIKKU Sr. General Manager



Page  
01 of 07  
+  
Dwg (01)  
[70364]

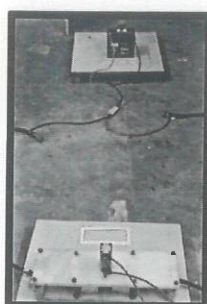
## DISCLAIMER




1. ICAT issues Test reports/ Extension reports/ Developmental Reports for vehicles/ parts/ components/ assemblies etc. based on the documents produced and/or prototype / vehicle(s) or sample(s) submitted by the applicant and testing thereof.
2. ICAT issues Test reports/ Extension reports/ Developmental Reports in compliance to Motor Vehicle Act/ Central Motor Vehicle Rules and their provisions as amended from time to time or any other statutory orders under which ICAT is authorized. Other Rules/Acts are outside the purview/scope of the Test reports/Extension reports/ Developmental test reports
3. Test(s) on prototype/ vehicle(s)/ sample(s) is/are carried out on the basis of standard procedures as notified under specific rules/ requested by the applicant. Results of such tests are property of bearer of Test Reports/ Extension Reports / Developmental test reports. These results cannot be disclosed unless specifically so ordered by Government, Court, etc
4. Unless otherwise supported by a separate Certificate, this Test report Extension Reports / Developmental test reports shall not be considered in isolation as valid Type approval for any vehicle
5. ICAT is not responsible for testing each vehicles/ parts/assemblies etc. for which Test Reports/ Extension reports/ Developmental test reports is issued. Further, ICAT is not responsible for ensuring manufacturing quality of the vehicles/ components/ parts/ assemblies etc. for which the Test Reports/ Extension reports/ Developmental test reports is /are issued.
6. ICAT is no way responsible for any misuse or copying any design/type/system in connection with entire vehicle/ components/parts and assemblies covered under the Test Reports/ Extension reports/ Developmental test reports is /are issued
7. Breach of any statutory provisions, of Indian laws or laws of other countries, will be sole responsibility of the customer. ICAT shall not be liable for any claims or damages made by the customer, whatsoever. The customer shall alone be liable for the same and undertakes to indemnify ICAT in this regard
8. Further, ICAT has the right, but not under obligation to initiate cancellation / withdrawal of the Test report/Extension/ Developmental test report is/are issued, in case of any fraud, misrepresentation, when it surfaces and comes in the knowledge of ICAT
9. No extract, abridgment or abstraction from this test report may be published or used to advertise the product without the written consent of the Director, ICAT, who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought. The appropriate local court at Gurugram shall have the jurisdiction in respect of any dispute, claim or liability arising out of this report.

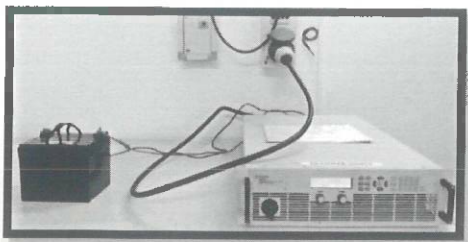
Prepared By		Checked By	
			
UDIT KAUL Dy. Manager		MAHENDAR PAL Asst. General Manager	Page 02 of 07 + Dwg(01) [70364]

### Annexure-I




#### 1.0 TEST REQUIREMENTS AND RESULTS:

Cl. No.	Test	Test Description	Observations/Results
<b>2.1 Electrical Tests</b>			
2.1.1	<b>Short Circuit test</b> (Test ID: ICAT/EEL/70364/01) Date of Test: 06.08.2019	 <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 <b>Acceptance Criteria:</b> 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 : 28°C</p> <p>Conductor of <math>\leq 5\text{m}\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>

Prepared By		Checked By	
			
UDIT KAUL Dy. Manager		MAHENDAR PAL Asst. General Manager	Page 03 of 07 + Dwg(01) [70364]

2.1.2	<p><b>Over Charge test</b>          (Test ID:          ICAT/EEL/70364/02)          Date of Test:06.08.2019</p>	 <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>).  <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 Pack was charged with 3.66 A for 10 hours.</p> <p>No physical damage, melting or explosion observed.</p> <p><b>Satisfactory.</b></p>
-------	--	--	---



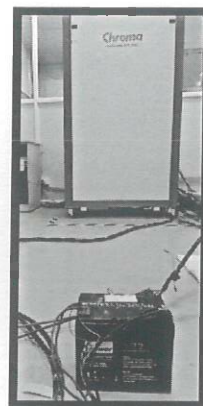
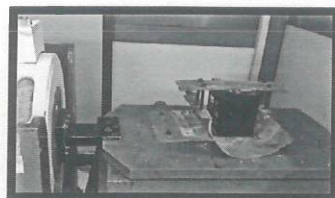
<p>Prepared By</p>  <p>UDIT KAUL Dy. Manager</p>		<p>Checked By</p>  <p>MAHENDAR PAL Asst. General Manager</p>	<p>Page 04 of 07 + Dwg(01) [70364]</p>
---	---	--	--



## 2.2 Mechanical Tests

2.2.1

**Vibration test**  
(Test ID:  
ICAT/EEL/70364/03)  
Date of test: 31.07.2019



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

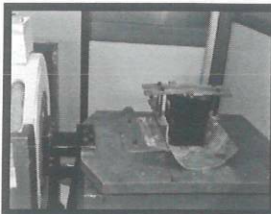

No electrolyte loss observed during test.




Immediately after the test, battery was discharged at 6.6 A And deterioration observed was not more than 10%.

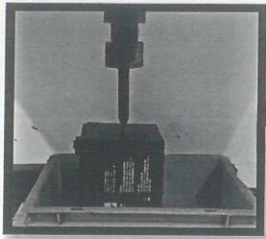
No physical damage or explosion observed.




**Satisfactory.**

<p>Prepared By</p>  <p><b>UDIT KAUL</b> Dy. Manager</p>		<p>Checked By</p>  <p><b>MAHENDAR PAL</b> Asst. General Manager</p>	<p>Page 05 of 07 + Dwg(01) [70364]</p>
--	---	---	--

2.2.2	<p><b>Shock test</b> (Test ID: ICAT/EEL/70364/04) Date of test: 13.08.2019</p>	<div data-bbox="630 380 901 593"></div> <div data-bbox="925 380 1189 593"></div> <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 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> <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 6.6 A and deterioration observed was not more than 10%.</p> <p>No physical damage or explosion observed.</p> <p><b>Satisfactory.</b></p>
-------	--	---	---

Prepared By		Checked By	
  UDIT KAUL Dy. Manager		  MAHENDAR PAL Asst. General Manager	<p>Page 06 of 07 + Dwg(01) [70364]</p>

2.2.3	<b>Roll-Over Test</b>	<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.</p> <p>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></p> <p>The volume of electrolyte spilled in each position shall not be more than 25 ml per module.</p>	Not Applicable
2.2.4	<b>Penetration Test</b> (Test ID: ICAT/EEL/70364/05) Date of test: 13.08.2019	 <p>The battery Cell shall be penetrated with a mild steel (conductive) pointed rod, which will be electrically insulated from the test fixture.</p> <p>Rate of penetration: <b>8 cm/s.</b></p> <p>Diameter of Rod: <b>20mm</b></p> <p>Orientation of penetration: <b>perpendicular to the electrode plates.</b></p> <p>Minimum Depth of penetration: <b>Through three cells or 100 mm</b></p> <p>The battery Cell should be observed, with the rod remaining in place, for a minimum of one hour after the test.</p> <p><b>Acceptance Criteria:</b></p> <p>At the end of the test, there shall be no:</p> <ol style="list-style-type: none"> <li>Melting of components.</li> <li>Fire or explosion.</li> </ol>	<p>After penetration, up to a depth through pack 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>

Prepared By		Checked By	
			
UDIT KAUL Dy. Manager		MAHENDAR PAL Asst. General Manager	Page 07 of 07 + Dwg(01) [70364]

6	5	4	3	2	1																		
			<table><tr><td>DRAWN</td><td>RIMPY</td></tr><tr><td>CHECKED</td><td>AMIMY Kr</td></tr><tr><td>DRWG NO</td><td>201908001</td></tr><tr><td>DESIGNED</td><td>VIKAS AGGARWAL</td></tr></table>			DRAWN	RIMPY	CHECKED	AMIMY Kr	DRWG NO	201908001	DESIGNED	VIKAS AGGARWAL										
DRAWN	RIMPY																						
CHECKED	AMIMY Kr																						
DRWG NO	201908001																						
DESIGNED	VIKAS AGGARWAL																						
<div><div><p>TOP VIEW</p></div><div><p>SIDE VIEW</p></div><div><p>ISOMETRIC PREVIEW</p></div></div>																							
<p>CONFIDENTIAL-This print and Design there is represented are the property of Computech Systems and may not be used in any manner detrimental to its interest.This print has been issued with the understanding that it will not be used for manufacturing for others and will be returned upon request.</p>																							
<table><tr><td colspan="2">IPOWER TECHNOLOGIES PVT. LTD.</td></tr><tr><td colspan="2">G-4, Harsha House ,Karampura Complex DELHI 110015</td></tr><tr><td>REV NO.</td><td>APPD. BY</td></tr><tr><td>NO OF PLACE</td><td>MODIFICATION NO</td></tr><tr><td></td><td>DATE</td></tr><tr><td colspan="2">TRADE NAME :- IPOWERR</td></tr><tr><td colspan="2">SCALE NTS</td></tr><tr><td colspan="2">CAPACITY : 12VOLT 33Ah @ C5</td></tr><tr><td colspan="2">DATE :- 12-08-19</td></tr></table>						IPOWER TECHNOLOGIES PVT. LTD.		G-4, Harsha House ,Karampura Complex DELHI 110015		REV NO.	APPD. BY	NO OF PLACE	MODIFICATION NO		DATE	TRADE NAME :- IPOWERR		SCALE NTS		CAPACITY : 12VOLT 33Ah @ C5		DATE :- 12-08-19	
IPOWER TECHNOLOGIES PVT. LTD.																							
G-4, Harsha House ,Karampura Complex DELHI 110015																							
REV NO.	APPD. BY																						
NO OF PLACE	MODIFICATION NO																						
	DATE																						
TRADE NAME :- IPOWERR																							
SCALE NTS																							
CAPACITY : 12VOLT 33Ah @ C5																							
DATE :- 12-08-19																							