Plastic Panel Mounting

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1. SCOPE

1.1. Content

This specification covers the performance, tests and quality standards for the Plastic panel mounting which includes **HB-LM-TOP** and **HB-PLM-PM-BASE**

1.2. Qualification

When tests are performed, the following specified specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification to the extent specified herein. In the case of a conflict between the requirements of this specification and the product drawing or of conflicts between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Connectivity Documents

A. Customer drawing and name
HB-LM-TOP / HB-PLM-PM-BASE

2.2. Other Documents

- EN 61984: Connectors - Safety requirements and tests
- EN 50467: Electrical connectors - requirements and test - Railway applications
- IEC 60068: Environmental testing
- IEC 60512: Connectors for electronic equipment -Test and measurements
- IEC 60529: Degrees of Protection Provided by Enclosures (IP Code)
- IEC 60664-1: Insulation coordination for equipment within low-voltage systems (Part 1)
- EN 61373: Railway application - Rolling stock equipment - Shock and vibration test
- ISO 6988: Metallic and other non-organic coatings - Sulfur dioxide test with general condensation of moisture

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Rated

- Operation Temperature -40°C ~+125°C

3.4. Performance and Test Description

Product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Paragraph 3.5. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per IEC 60512 / EN 61984.

3.5. Test Requirements and Procedures Summary

General			
No.	**Test Items**	**Requirements**	**Condition according to**
3.5.1	Visual and dimensional examination	Meets requirements of product drawing	Visual and dimensional examination IEC 60512-1-1/-2, Test 1a and 1b 6.2 of EN 61984
Mechanical			
3.5.2	Retention force	HB-LM-TOP: 200N HB-PLM-PM-BASE: 250N	Test load applied in axial direction, test speed:20mm/min, permissible shift contacts of 1.0mm, Test 15a of IEC 60512-15-1
3.5.3	Mechanical strength impact	Connector and internal insulation shall no damage to impair normal use. A reduction of clearance and creepage distance is not allowed. 6.18.1 & 6.18.3 of EN 61984	Dropping height: - 750mm for specimens of mass≤ 250g - 500mm for specimens of mass>250g Dropping cycles:8 positions in 45° step, one cycles per position IEC 60512-7-2 Test 7b
3.5.4	Mechanical Operation (Durability)	500 operation cycles without load No damage likely to impair normal use 6.14.1 of EN 61984	Shall be engaged and disengaged by means of A) a device simulating normal operating conditions at the speed of approximately 50mm/min B) manual mating/un-mating 300 Max. cycle per hour IEC 60512-9-1 Test 9a 7.3.9 of EN 61984

3.5.5	Vibration, Random	No damage likely to impair function No discontinuities greater than t>1μs		Frequency:5~150Hz Per EN 61373, Category 1, Class B (IEC60068-2-6 Test Fc)
3.5.6	Shock	No damage likely to impair function No discontinuities greater than t>1μs		Acceleration:50m/s^2 Duration:30ms Total 18 shocks (three positive and three negatives in each of the three orthogonal axes) Per EN 61373
Electrical				
3.5.7	Contact Resistance	Initial	Max.5mΩ	Test current: 1A Measure points[a] at the end of the termination Max three contacts per specimen plus protective earthing, if any IEC 60512-2-2 Test 2b
		Final	The change of contact resistance shall be no more than 50 % of the reference value or ⩽5 mΩ. The higher value is permissible	
Environmental				
3.5.8	Cold	No damage likely to impair function		Subject mated specimen to -40℃ Duration time:16h, Test Ab Per IEC 60512-11-10 Test 11j (IEC 60068-2-1)
3.5.9	Dry Heat	No damage likely to impair function		Subject mated specimen to +125℃ Duration time:168h Test Bb Per IEC 60512-11-9 Test 11i (IEC 60068-2-2)
3.5.10	Damp Heat, cyclic	No damage likely to impair function		Subject mated specimen to Min ambient temperature: 25℃ Max ambient temperature: 45℃ Number of cycles:21 Duration time:12h+12h Variant 1 IEC 60512-11-12 Test 11m
3.5.11	Rapid Change of temperature (Temperature Cycle)	No damage likely to impair function		Subject mated specimen to Ta=-40±2℃ to Tb=+125±2℃, duration t1: 1h each extreme, 100 cycles IEC 60512-11-4 Test 11d (IEC 60068-2-14 Test Na)
[a] measuring point: at the conductor as close as possible to the termination, if this is not possible, the conductor resistance shall be recalculated (refer to Annex Figure 1).				

Number of Specimen as below table 1:

Table 1 - Number of Specimen		
Test	**Description**	**Numbers & consist of**
Group A	Mechanical Test	3 pairs products with inserts
Group B	Service life Test	3 pairs products with inserts and wire.
Group C	Climatic Test Mated	3 pairs products with inserts
Group D	Vibration and Shock Test	3 pairs products with inserts and wire.
Group E	Temperature Cycle Test	3 pairs products with inserts
Note: For connector family of the same design and comparable size, test may be made only on that member of the family which represents the worst case for that test.		

3.6. Test Sequences

Test or Examination	**Test Group**				
	A	B	C	D	E
	Test Sequence[1)]				
Visual and dimensional examination	1,3	1,4	1,5	1,6	1,5
Retention force		3	4		4
Mechanical strength impact	2				
Mechanical Operation (Durability)		2			
Vibration, Random				3	
Shock				4	
Contact Resistance				2,5	
Cold			2		
Dry Heat			3		
Damp Heat, cyclic					3
Rapid Change of temperature (Temperature Cycle)					2

Notes:

1) Numbers indicate the sequence in which the tests are performed.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

B. Test Sequence

Specimens shall be tested in accordance with the paragraph 3.6 test sequence.

4.2. Requalification Testing

If changes significantly affecting form, fit or functions are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of paragraph 3.5. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification. Bulk wire resistance shall be subtracted from resistance readings.

Annex

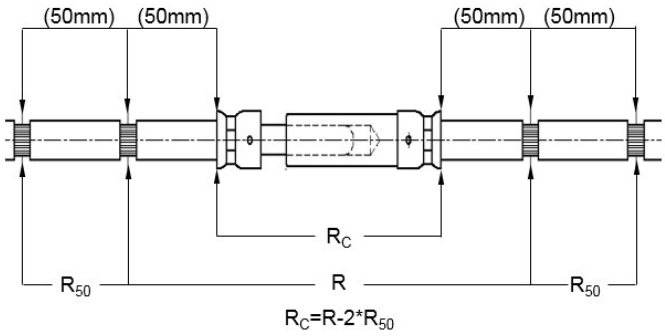

Figure 1: Contact resistance measure point