BSI Standards Publication

Test methods for electrical materials, printed boards and other interconnection structures and assemblies

Part 5-506: General test methods for materials and assemblies — An intercomparison evaluation to implement the use of fine-pitch test structures for surface insulation resistance (SIR) testing of solder fluxes in accordance with IEC 61189-5-501

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National foreword

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Test board concept for intercomparison 7
4.1 The need for a fine-pitch SIR pattern 7
4.2 Test board design 8
4.3 Test board fluxing 9
5 Test procedure for intercomparison 10
5.1 Sample preparation 10
5.2 Preparation of samples for humidity chamber 11
5.3 Placement of samples inside the humidity chamber 11
5.4 Resistance measurements 12
5.5 Evaluation of results 12
5.6 Additional information 12
6 Results 12
Bibliography 23

Figure 1 – TB144 9
Figure 2 – Connector arrangement 11
Figure 3 – Sample orientation in test chamber 12
Figure 4 – Participants (a to f) resistance measurements for the six test patterns on the checker board 13
Figure 5 – Participant A control boards 13
Figure 6 – Participant A flux loaded boards 14
Figure 7 – Participant B control boards 14
Figure 8 – Participant B flux loaded boards 14
Figure 9 – Participant C control boards 15
Figure 10 – Participant C flux loaded boards 15
Figure 11 – Participant D control boards 15
Figure 12 – Participant D flux loaded boards 16
Figure 13 – Participant E control boards 16
Figure 14 – Participant E flux loaded boards 16
Figure 15 – Participant F control boards 17
Figure 16 – Participant F flux loaded boards 17
Figure 17 – Participant G control boards 17
Figure 18 – Participant G flux loaded boards 18
Figure 19 – Participant D, and evidence of a fibre and the effect on the SIR 18
Figure 20 – Participant E and evidence or corrosion shorting across the gap 18
Figure 21 – Participant G and evidence of a water droplet and the resulting drop in SIR and dendrite like failure 19
Figure 22 – Participant G and a corrosion defect probably from a flux residue 19

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Document Sharing Hub

Full document details: PD IEC TR 61189-5-506:2019

Figure 23 – Participant C dendrites and corrosions formed on all SIR patterns of all fluxed samples tested at 85°C/85% 19
Figure 24 – The average final SIR value for the control boards 20
Figure 25 – The average final SIR value for the flux loaded boards 20
Figure 26 – The average final SIR for flux-loaded patterns by participant 21
Figure 27 – Final SIR plotted as ohm.squares 21
Figure 28 – Ratio of the log Ω.square value to the 500-µm pattern 22

Table 1 – SIR pattern information 9
Table 2 – Flux to be used for SIR evaluation test 10
Table 3 – Samples for SIR evaluation testing 10

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

TEST METHODS FOR ELECTRICAL MATERIALS, PRINTED BOARDS AND OTHER INTERCONNECTION STRUCTURES AND ASSEMBLIES –

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IEC/TR 61189-5-506, which is a technical report, has been prepared by IEC technical committee 91: Electronics assembly technology.

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The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
91/1500/DTR	91/1530A/RVDTR

Full information on the voting for the approval of this Technical Report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61189 series, published under the general title *Test methods for electrical materials, printed boards and other interconnection structures and assemblies*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This document addresses the development of IEC 61189-5-501 and the introduction of a fine-pitch test pattern. The introduction of this pattern is needed to meet the need for IEC 61189-5-501 to reflect current assembly technology. This document describes an intercomparison that tests a new test pattern and benchmarks it to existing test patterns. The work validates the introduction of the new fine-pitch test pattern.

It is well known that structures at fine pitches with flux residues are more susceptible to corrosion issues and electrochemical migration (ECM) problems. Characterization of flux residues in terms of ECM are commonly characterized using SIR testing. A key parameter of the SIR test is the comb pattern used and gap between the electrodes. The current B24 and B25 with their 500-µm and 318-µm gap patterns are not representative of fine pitches. It has been proposed to use a 200-µm gap pattern, and this document describes an intercomparison that validates the introduction of the 200-µm gap pattern.

This document describes an exercise that used a new test board that included the B24 and B25 patterns with an additional 200-µm pattern, with each pattern duplicated, giving six patterns in all on each test board. This work was motivated by an update to IEC 61189-5-501. A protocol for the testing was developed that took a standardised test rosin flux and defined the flux loading and thermal conditioning. Seven laboratories took part from five countries. The test boards were prepared centrally and then tested in the seven laboratories, and the results analysed to validate the usage of the 200-µm pattern. The document describes the intercomparison and the data analysis.

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