PD IEC/TS 61967-3:2014

BSI Standards Publication

Integrated circuits — Measurement of electromagnetic emissions

Part 3: Measurement of radiated emissions — Surface scan method

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/47, Semiconductors.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2014

ISBN 978 0 580 78113 1
ICS 31.200

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 September 2014.

Amendments/corrigenda issued since publication

Date	Text affected

IEC TS 61967-3

Edition 2.0 2014-08

TECHNICAL SPECIFICATION

SPECIFICATION TECHNIQUE

colour inside

Integrated circuits – Measurement of electromagnetic emissions – Part 3: Measurement of radiated emissions – Surface scan method

Circuits intégrés – Mesure des émissions électromagnétiques – Partie 3: Mesure des émissions rayonnées – Méthode de balayage en surface

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

W

ICS 31.200

ISBN 978-2-8322-1809-9

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTEGRATED CIRCUITS – MEASUREMENT OF ELECTROMAGNETIC EMISSIONS –

Part 3: Measurement of radiated emissions – Surface scan method

FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 61967-3, which is a technical specification, has been prepared by subcommittee 47A: Integrated circuits, of IEC technical committee 47: Semiconductor devices.

This second edition cancels and replaces the first edition published in 2005. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Removal of:
   – 9.4 Data analysis;
   – Annex D – Analysing the data from near-field surface scanning.
b) Addition of:
   – Introduction
   – 9.4 Measurement data
   – 9.5 Post-processing
   – 9.6 Data exchange
   – Annex D – Coordinate systems
c) Expansion of:
   – 8.4 Test technique
   – Annex A – Calibration of near-field probes

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
47A/925/DTS	47A/937/RVC

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

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

A list of all parts in the IEC 61967 series, published under the general title *Integrated circuits – Measurement of electromagnetic emissions*, can be found on the IEC website.

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

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Techniques for scanning near-fields radiated by integrated circuits and their surrounding environment can identify the areas of radiation, which may cause interference to nearby devices. The ability to associate magnetic or electric field strengths with a particular location on a device can provide valuable information for improvement of an IC both in terms of functionality and EMC performance.

Near-field scan techniques have considerably evolved over recent years. The improved sensitivity, bandwidth and spatial resolution of the probes offer analysis of integrated circuits operating into the gigahertz range. The ability to measure radiation both in the frequency and time domain allows not only analysis of fields generated by an IC, but also fields generated by externally applied disturbances propagating through the device. Post-processing can considerably enhance the resolution of a near-field scan measurement and the measured data can be shown in various ways, per user's choice.

INTEGRATED CIRCUITS – MEASUREMENT OF ELECTROMAGNETIC EMISSIONS –

Part 3: Measurement of radiated emissions – Surface scan method

1 Scope

This part of IEC 61967 provides a test procedure which defines an evaluation method for the near electric, magnetic or electromagnetic field components at or near the surface of an integrated circuit (IC). This diagnostic procedure is intended for IC architectural analysis such as floor planning and power distribution optimization. This test procedure is applicable to measurements on an IC mounted on any circuit board that is accessible to the scanning probe. In some cases it is useful to scan not only the IC but also its environment. For comparison of surface scan emissions between different ICs, the standardized test board defined in IEC 61967-1 should be used.

This measurement method provides a mapping of the electric or magnetic near-field emissions over the IC. The resolution of the measurement is determined by the capability of the measurement probe and the precision of the probe-positioning system. This method is intended for use up to 6 GHz. Extending the upper limit of frequency is possible with existing probe technology but is beyond the scope of this specification. Measurements may be carried out in the frequency domain or in the time domain.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

IEC 61967-1, *Integrated circuits – Measurement of electromagnetic emissions, 150 kHz to 1 GHz – Part 1: General conditions and definitions*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 61967-1, IEC 60050-131 and IEC 60050-161, as well as the following apply.

3.1.1
altitude
distance between the tip of the near-field probe and the reference plane of the scan (e.g. the PCB, the upper surface of the package)

Note 1 to entry: The term “altitude” refers to the vertical direction in a Cartesian coordinate system (Z-axis) in this document.