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Nanomanufacturing — Key control characteristics

Part 2-4: Carbon nanotube materials — Test methods for determination of resistance of individual carbon nanotubes

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National foreword

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CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms, definitions, and abbreviated terms 6
3.1 Terms and definitions 6
3.2 Abbreviated terms 8
4 Measurement of resistance 8
4.1 General 8
4.2 Method for processing and fabrication of DUT 8
4.3 4-probe measurement 8
5 Reporting data 9
6 Data analysis / interpretation of results (Annex A) 10
6.1 General 10
6.2 Measurement error 10
6.3 Need to prepare the proper electric probing circuit 11
6.4 Need to prepare the proper substrate and electric contact 11
6.5 Dynamic range 11
6.6 Current density 11
6.7 Voltage bias of the substrate 11
6.8 Measurement in vacuum 11
Annex A (informative) Case study 12
A.1 4-probe measurement of MWCNT 12
A.1.1 I-V measurements of MWCNT 12
A.1.2 Fabrication process information of MWCNT and DUT 14
A.2 4-probe measurement of SWCNT 15
A.2.1 I-V measurements of SWCNT 15
A.2.2 Fabrication process information of SWCNT and DUT 18
Bibliography 19

Figure 1 – 4-probe measurement in a SEM chamber 9
Figure 2 – A crooked/curved CNT under measurement 10
Figure 3 – I-V measurement of a sufficiently straight CNT 11
Figure A.1 – I-V measurements of a CNT with different lengths, L 12
Figure A.2 – I-V relationships for different CNT lengths – 2-probe measurement 13
Figure A.3 – I-V relationships for different CNT lengths – 2-probe measurement (0 to 0,5 V) 13
Figure A.4 – I-V relationships for different CNT lengths – 4-probe measurement 14
Figure A.5 – Resistance vs. CNT length 14
Figure A.6 – I-V relationships of SWCNT 15
Figure A.7 – Resistance vs. SWCNT length 16
Figure A.8 – I-V relationships of SWCNT under the electron-beam exposure 17
Figure A.9 – Breakdown characteristics of SWCNT 18

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NANOMANUFACTURING – KEY CONTROL CHARACTERISTICS –

Part 2-4: Carbon nanotube materials – Test methods for determination of resistance of individual carbon nanotubes

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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 TS 62607-2-4, which is a Technical Specification, has been prepared by IEC technical committee 113: Nanotechnology for electrotechnical products and systems.

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

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

A list of all parts in the IEC 62607 series, published under the general title *Nanomanufacturing – Key control characteristics*, 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 website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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INTRODUCTION

Carbon nanotubes (CNTs) are one-dimensional conductors that exhibit a rich variety of low-dimensional electric transport phenomena. Ballistic conduction is the typical nano-enabled characteristic that possesses the largest potential for industrial application. In the field of nanoelectronics, for example, CNT-based interconnects are a promising alternative to conventional Cu interconnects. However, even in the academic research society, the resistive characteristics have not yet been systematically investigated. This is because these characteristics are very sensitive to the protocol and the measurement conditions. Furthermore, since the individual CNT reaches the nanometre dimension, the contact resistance has a larger relative impact on the measurement. These bottlenecks impede not only the above-mentioned interconnect application but also developments of various electrotechnical applications, such as thermoelectric devices in which the electrical resistance is required to evaluate the figure of merit.

This document offers the accurate and reproducible test method for determining the resistance of CNT and the dependability of the measurement.

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