

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LAM RESEARCH CORP.,

Petitioner

v.

INPRIA CORP.,

Patent Owner

Patent No. 9,823,564

Inter Partes Review No.
IPR2024-00033

DECLARATION OF SYLVIA HALL-ELLIS, PH.D.

I. INTRODUCTION

1. My name is Sylvia D. Hall-Ellis. I have been retained as an expert on behalf of Lam Research Corp. (“Petitioner”).

2. I have written this report on behalf of Petitioner to provide my expert opinion regarding the authenticity and public availability of several publications. My report sets forth my opinions in detail and provides the basis for my opinions regarding the public availability of these publications.

3. I reserve the right to supplement or amend my opinions, and bases for them, in response any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this report.

4. I am being compensated for my time spent working on this matter at my normal consulting rate of \$350 per hour, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this report, the substance of my opinions, or the outcome of this litigation. I have no other interests in this proceeding or with any of the parties.

5. All of the materials that I considered are discussed explicitly in this declaration.

II. QUALIFICATIONS

6. I am currently an Adjunct Professor in the School of Information at San José State University. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph.D. in Library Science from the University of Pittsburgh in 1985. Over the last 50-plus years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

7. I am a member of the American Library Association (ALA) and its Association for Library Collections & Technical Services (ALCTS) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the Chair of the ALCTS Division's Task Force on Competencies and Education for a Career in Cataloging. Additionally, I have served as the Chair for the ALA Office of Diversity's Committee on Diversity, as a member of the REFORMA National Board of Directors, as a member of the Editorial Board for the ALCTS premier cataloging journal, *Library Resources and Technical Services*, as a Co-Chair of the Library

Research Round Table (LRRT) for the American Library Association, and as a member of the LRRT Nominating Committee.

8. I have also given over one hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

9. My full curriculum vitae is attached hereto as Exhibit 1028.

III. PRELIMINARIES

10. *Scope of this declaration.* I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could have located the documents before on or around the listed dates of their respective publications below.

11. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

12. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (*i.e.*, I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

13. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

14. *Persons of ordinary skill in the art.* I am told by counsel that the subject matter of this proceeding generally relates to inorganic compositions used as resist coating materials.

15. I have been informed by counsel that a “person of ordinary skill in the art at the time of the inventions” is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

16. I am told by counsel that persons of ordinary skill in this subject matter or art would have had a masters or Ph.D., in a relevant discipline such as in chemistry, materials science, electrical engineering, chemical engineering, physics, or an equivalent field. The POSA would also have 1-3 years of experience in the research, design, development and/or testing of resist materials.

17. It is my opinion that such a person would have been engaged in research, learning thorough study and practice in the field and possibly through formal instruction the bibliographic resources relevant to his or her research. In

the 2010 timeframe, such a person would have had access to a vast array of long-established print resources in the relevant field.

IV. LIBRARY CATALOGING PRACTICES

A. MARC RECORDS AND THE ONLINE LIBRARY CATALOG

18. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information.¹ MARC was first developed in the 1960s by the Library of Congress. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. Today, MARC is the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.

19. MARC is a framework into which descriptive bibliographic data are transcribed to interact with the software in online library catalogs to provide access to books, journals, and other resources in the collection. The bibliographic data provide points of access and can be searched by a POSA at the time of the invention to identify and obtain resources in the library collection. An information seeker (or POSA) can search a local online library catalog or the holdings of a group of libraries in a state or region or in the global catalog WorldCat.

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/> (last visited July 5, 2023).

20. MARC records are not designed for public viewing. Although a significant number of libraries provide access to the MARC version of a bibliographic record, the public display is designed to show information in a succinct manner that is quickly understood and useful to the information seeker. Libraries determine the default search for the online catalog to make the entry of search terms efficient and result in a successful search. Information seekers can enter a keyword, title, author, or standard number for the item. Libraries may also provide a search capability called “Summon” that allows the information seeker to enter known information about the item to conduct a search.

21. Since at least the early 1970s and continuing to the present day, MARC has been the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.² As explained by the Library of Congress:

You could devise your own method of organizing the bibliographic information, but you would be isolating your library, limiting its options, and creating much more work for yourself. Using the MARC standard prevents duplication of work and allows libraries

² A complete history of the development of MARC can be found in *MARC: Its History and Implications* by Henrietta D. Avram (Washington, DC: Library of Congress, 1975) and available online from the Hathi Trust (<https://babel.hathitrust.org/cgi/pt?id=mdp.39015034388556;view=1up;seq=1>; last visited July 5, 2023).

to better share bibliographic resources. Choosing to use MARC enables libraries to acquire cataloging data that is predictable and reliable. If a library were to develop a “home-grown” system that did not use MARC records, it would not be taking advantage of an industry-wide standard whose primary purpose is to foster communication of information.

Using the MARC standard also enables libraries to make use of commercially available library automation systems to manage library operations. Many systems are available for libraries of all sizes and are designed to work with the MARC format. Systems are maintained and improved by the vendor so that libraries can benefit from the latest advances in computer technology. The MARC standard also allows libraries to replace one system with another with the assurance that their data will still be compatible.

Why Is a MARC Record Necessary? LIBRARY OF CONGRESS.³

22. Thus, almost every major library in the world is MARC-compatible. See, e.g., *MARC Frequently Asked Questions (FAQ)*, LIBRARY OF CONGRESS.⁴ (“MARC is the acronym for MACHine-Readable Cataloging. It defines a data

³ <http://www.loc.gov/marc/umb/um01to06.html#part2>

⁴ <https://www.loc.gov/marc/faq.html>

format that emerged from a Library of Congress-led initiative that began fifty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today.”). MARC is the ANSI/NISO Z39.2-1994 standard (reaffirmed in 2016) for Information Interchange Format. The full text of the standard is available from the Library of Congress.⁵

23. Examining the MARC records for a specific item reveals the comprehensive data transcribed about a particular item at the time that cataloging and classification occurred. In addition to the creator, title, subjects, and standard numbers, additional information may provide additional and relevant data depending on the type of resource. Understanding the full extent of bibliographic data for an item and the points of access associated with it provides essential information that can be used to determine the indexing and public availability for documents described in this declaration.

B. MARC RECORDS

24. A MARC record comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follow. For example, a work’s title is recorded in Field 245; the primary author of the work is transcribed

⁵ <http://www.loc.gov/marc/bibliographic/>

in Field 100; an item's International Standard Book Number ("ISBN") consisting of ten or thirteen digits is transcribed in Field 020; an item's International Standard Serial Number ("ISSN") is transcribed in Field 022; the Library of Congress classification notation is recorded in Field 050; and the publication date is recorded in Field 260 under the subfield "c." If a work is a periodical, then its publication frequency is recorded in Field 310, and the publication dates (e.g., the first and last publication) are recorded in Field 362, which is also referred to as the enumeration/chronology field.⁶

25. The library that created the record is recorded in Field 040 in subfield "a" with a unique library code. When viewing the MARC record online via Online Computer Library Center's ("OCLC") bibliographic database, hovering over this code with the mouse reveals the full name of the library. I used this method of "mousing over" the library codes in the OCLC database to identify the originating library for the MARC records discussed in this Declaration. Where this "mouse over" option was not available, I consulted the Directory of OCLC Libraries to identify the institution that created the MARC record.⁷

26. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available

⁶ <http://www.loc.gov/marc/bibliographic/bd3xx.html>

⁷ <https://www.oclc.org/en/contacts/libraries.html>

through the Library of Congress.⁸ For example, 6XX fields are termed “Subject Access Fields.”⁹ Among these, for example, is the 650 field; this is the “Subject Added Entry – Topical Term” field.¹⁰ The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” These entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is the “Library of Congress Call Number.”¹¹ A defined portion of the Library of Congress Call (LCC) Number is the classification number, and “source of the classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” Thus, included in the 050 field is a subject matter classification. Further, the 082 field is the “Dewey Decimal Call Number.”¹² A defined portion of the Dewey Decimal Call (DDC) Number is the classification number, and “source of the classification number is the *Dewey Decimal Classification and Relative Index*.” Thus, included in the 082 field is a subject

⁸ <http://www.loc.gov/marc/bibliographic/>

⁹ <http://www.loc.gov/marc/bibliographic/bd6xx.html>

¹⁰ <http://www.loc.gov/marc/bibliographic/bd650.html>

¹¹ <http://www.loc.gov/marc/bibliographic/bd050.html>

¹² <http://www.loc.gov/marc/bibliographic/bd082.html>

matter classification. Each item in a library has a single classification number. A library selects a classification scheme (*e.g.*, the Library of Congress classification scheme just described or a similar scheme such as the Dewey Decimal classification scheme) and uses it consistently. When the Library of Congress assigns the LCC classification number, it appears as part of the 050 field. When the Library of Congress assigns the DDC classification number, it appears as part of the 082 field. If a local library assigns the classification number, it appears in a 090 field. In either scenario, the MARC record includes a classification number that represents a subject matter classification.

C. OCLC

27. The OCLC was created “to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific,

literary and educational knowledge and information.”¹³ Among other services, OCLC and its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>), used by independent and institutional libraries throughout the world.

28. OCLC also provides its members online access to MARC records through its OCLC bibliographic database. When an OCLC member institution acquires a work, it creates a MARC record for this work in its computer catalog system in the ordinary course of its business. MARC records created at the Library of Congress are tape-loaded into the OCLC database through a subscription to MARC Distribution Services daily or weekly. Once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress, the MARC record is then made available to any other OCLC members online, and therefore made available to the public. Accordingly, once the MARC record is created by a cataloger at an OCLC member institution or is tape-loaded from the Library of Congress or another library anywhere in the world, any publication corresponding to the MARC record has been cataloged and indexed according to its subject matter such that a person interested in that subject matter

¹³ Third Article, Amended Articles of Incorporation of OCLC Online Computer Library Center, Incorporated (available at <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>).

could, with reasonable diligence, locate and access the publication through any library with access to the OCLC bibliographic database or through the Library of Congress.

29. When an OCLC member institution creates a new MARC record, OCLC automatically supplies the date of creation for that record. The date of creation for the MARC record appears in the fixed Field (008), characters 00 through 05. The MARC record creation date reflects the date on which, or shortly after which, the item was first acquired or cataloged. Initially, Field 005 of the MARC record is automatically populated with the date the MARC record was created in year, month, day format (YYYYMMDD) (some of the newer library catalog systems also include hour, minute, second (HHMMSS)). Thereafter, the library's computer system may automatically update the date in Field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has been moved to a different shelving location within the library). Field 005 is visible when viewing a MARC record via an appropriate computerized interface, but when a MARC record is printed to hardcopy, no "005" label appears. The initial Field 005 date (*i.e.*, the date the MARC record was created) does appear, however, next to the label "Entered."¹⁴ The date upon which the most recent update to Field 005

¹⁴ Field 005 is visible when viewing a MARC record via an appropriate computerized interface. But when a MARC record is printed directly to hardcopy

occurred also appears, next to the label “Replaced.” Thus, when an item’s MARC record has been printed to hardcopy—as is the case with the MARC attachments to this Declaration—the date reflected next to the label “Entered” is necessarily on or after the date the library first cataloged and indexed the underlying item.

30. Once one library has cataloged and indexed a publication by creating a MARC record for that publication, other libraries that receive the publication do not create additional MARC records—the other libraries instead rely on the original MARC record. They may update or revise the MARC record to ensure accuracy, but they do not replace or duplicate it. This practice does more than save libraries from duplicating labor. It also enhances the accuracy of MARC records. Further, it allows librarians around the world to know that a particular MARC record is authoritative (in contrast, a hypothetical system wherein duplicative records were created would result in confusion as to which record is authoritative).

31. Catalogers can create MARC records for all types of print, online, and digital resources. The date of creation of the MARC record by a cataloger at an OCLC member institution reflects when the underlying item is accessible to the public. Upwards of two-thirds to three-quarters of book sales and magazine subscriptions to libraries come from a jobber or wholesaler for online and print

from the OCLC database, the “005” label is not shown. The date in the 005 field instead appears next to the label “Replaced.”

resources. These resellers make it their business to provide items to their customers as fast as possible, often providing turnaround times of only a single day after publication. Libraries purchase a significant portion of the balance of their books and journals directly from publishers themselves, which provide delivery on a similarly expedited schedule. In general, libraries make these purchases throughout the year and shelve the newly received items as soon thereafter as possible to make them available to their patrons.

32. *Journals.* Catalogers can create MARC records for all types of print, online, and digital resources. For example, MARC records cover serial publications, including both serially-published monographs and journals. OCLC hosts MARC records for more than 320 million serial publications. Serial publications are those publications that have the same collective title but are intended to be continued indefinitely with enumeration such as a volume or issue number (*e.g.*, magazines, journals, etc.). In the OCLC bibliographic database, the first issue of the serial publication is typically cataloged (*i.e.*, a corresponding MARC record is created), but the date is left open-ended with the use of a punctuation mark such as a dash. OCLC serial publication MARC records represent the entire run of the serial title. With knowledge of the first issue published, future issues can be predicted based on the information provided in the MARC record, for example in field 362. In my extensive professional experience,

is it highly unusual for a library to stop collecting and shelving a serial publication prior to the end of its publication run. If a subscription to a serial publication ends its run or is cancelled before the end of its run, the library will denote that it has stopped receiving new volumes by filling in the end date in the MARC record.

33. The handling of printed journal subscriptions is shown on the cover or the first few pages of individual issues. As was the best practice among libraries, issues arrived at a central facility and were immediately received, verified as part of a subscription, checked in, and stamped or labeled with the institution's name and date. Determining that the issue was part of the library subscription ensured that the entire set of publications for the year had been received so that they could be professionally bound and retained. This process also verified that all of the published issues arrived so that the library staff did not have to request or claim an issue that did not arrive as expected. In large public libraries with branches and multi-campus libraries within academic institutions, the journals were sorted and delivered to the subscribing unit. The new issue was placed in the public area; the older issue was stored so that it remained available.

34. The foregoing process has been standard library practice longer than I have been working in the profession. I first learned the steps in the process in the late 1970s and later supervised it. Although the checking in process has become automated and now links electronically to holdings records for the MARC record

for each serial title, the manual placement of a stamp or label and placing the issue in a public area has not changed for 50 years. Unless I note otherwise below in reference to a specific serial publication, it is my expert opinion that this standard protocol was followed for all of the serial publications discussed below.

35. In preparing this report, I used authoritative databases, such as the OCLC bibliographic database and the Library of Congress Online Catalog, to confirm citation details of the various publications discussed.

36. *Indexing.* A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodical and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from a publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both indexing and library date information. However, date information for indexing entries is often unavailable. This is especially true for online indices.

37. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

38. Online indexing services commonly provide bibliographic

information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document.

39. Before the widespread development of online databases to index articles in journals, magazines, conference papers, and technical reports, libraries purchased printed volumes of indices. Graduate library school education mandated that students learn about the bibliographic control of disciplines, the prominent indexing volumes, and searching strategies required to use them effectively and efficiently. Half of the courses that I studied in library school were focused on the bibliography and resources in academic disciplines.

40. Librarians consulted with information seekers to verify citations, check availability in union catalogs, printed books catalogs, the OCLC database, and make formal requests for materials (e.g., books, conference proceedings, journal articles). Requests were transmitted using Telex machines, rudimentary email systems, and the United States Postal Service. During my career, I have performed and supervised staff who handled these resource sharing tasks.

41. A major firm known for the breadth of subjects and comprehensive treatment in the preparation of index volumes, the H. W. Wilson Company offered

these reference resources since the firm was founded in 1898. The *Reader's Guide to Periodical Literature* is one of the best-known titles available from H. W. Wilson. Each volume includes a comprehensive index for 300 of the most popular and important periodicals published in the United States and Canada. Information seekers have subject access expressed in plain language terminology, author access, and cross references to find the desired results from their searches. The family of index titles included *Science & Technology Index*, *Business Periodicals*, *Applied Science & Technology Index*, *Humanities Index*, *Biological & Agricultural Index*, and *Industrial Arts Index*. These printed indices have been superseded by digital database offerings available to information seekers through Ebsco.

42. Online indexing services such as *Google Scholar*¹⁵ or *ScienceDirect*¹⁶ commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document.

43. A citation of a document by another is evidence that the document was publicly available and in use no later than the publication date of the citing document.

¹⁵ <https://scholar.google.com/>

¹⁶ <https://www.sciencedirect.com/>

V. DOCUMENT 1: EXHIBIT 1008 (“STOWERS”)

44. Attached hereto as Exhibit 1008 is a doctoral dissertation titled *Direct Patterning of Solution Deposited Metal Oxides* by Jason K. Stowers (hereafter “Stowers”) and published in 2008. Exhibit 1008 is a true and correct copy of the abstract, acknowledgements, contribution of authors, title page, table of contents, list of figures, list of tables, seven chapters, bibliography, and text that I downloaded from the *ProQuest Dissertations and Theses* database developed and maintained by University Microfilms (UMI). The dissertation title page shows a defense date of August 14, 2008. Specifically, the text is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1008 was found within the custody of the custodian to whom the author granted permission to make copies and reproductions. Exhibit 1008 is a true and correct copy in a condition that creates no suspicion about its authenticity.

45. A dissertation exhibits the following characteristics: the dissertation is attributed to a single creator or author (in this case Jason K. Stowers) who affixes a date of creation (in this case August 18, 2008), recognizes a committee of three or more faculty members with their affiliations, (in this case Douglas A. Keszler, Jeanette Roberts, Pooya Tadayon, Heather A. S. Platt, Kai Jiang, Stephen Meyers, and Jeremy Anderson), a list of scholarly references (in this case 85 references),

and publishes the document through the higher education institute conferring the doctoral degree (in this case the Department of Chemistry at Oregon State University).

46. Attached hereto as Attachment 1A is a true and correct copy of the online catalog record for this dissertation from The Valley Library at Oregon State University (Corvallis, Oregon). The catalog record indicates that a copy of the dissertation is located in The Valley Library at Oregon State University, in the institution's digital repository, ScholarsArchive@OSU,¹⁷ and through the *ProQuest Dissertations and Theses* database. I personally identified and retrieved the library catalog record which is Attachment 1A.

47. Attached hereto as Attachment 1B is a true and correct copy of the MARC record for the doctoral dissertation titled *Direct Patterning of Solution Deposited Metal Oxides* obtained from the OCLC bibliographic database. I personally identified and retrieved the MARC record that is Attachment 1B. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 1B, that library code is "ORE," which means that the MARC record for this book was created in The Valley Library at Oregon State University. As can be seen in the "Entered" field in the MARC record for this exhibit, a cataloger in The Valley Library at Oregon State University created

¹⁷ <http://hdl.handle.net/1957/9543>

OCLC record number 263038762 on October 21, 2008, as show in the “Entered” field (“20081021”). The library continues to update and enhance this MARC record to meet current cataloging rules. The most recent enhancement to Attachment 1B occurred on February 19, 2023, as shown in the “Replaced” field (“20230219”). I personally identified and retrieved the MARC record that is Attachment 1B.

48. Attachment 1B further includes an entry in field 050 (“LD4330 2009D \$b Stowers, Jason K.”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system). Attachment 1B includes three descriptors reading “Metallic oxides” (see Attachment 1C, Library of Congress subject heading sh85084122), “Lithography, Electron beam” (see Attachment 1D, Library of Congress subject heading sh85077608), and “Photolithography” (see Attachment 1E, Library of Congress subject heading sh85101379) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 1B was indexed by virtue of at least two independently sufficient classifications: the field 090 entry and the field 650 entries. Further, as of October 21, 2008, the MARC record attached hereto as Attachment 1B was accessible through any library with access to the OCLC bibliographic database or through an individual library.

49. Attachment 1B indicates that the Stowers dissertation cataloged in The Valley Library at Oregon State University is currently available from 2 institutions, at the website included in field 856, and the *ProQuest Dissertations and Theses* database. In view of above, this doctoral dissertation was publicly available on October 21, 2008, because by that date it had been received, cataloged, and indexed in The Valley Library at Oregon State University, placed in the custody of UMI, and made part of the OCLC bibliographic database.

50. For these reasons, it is my opinion that Exhibit 1008 was published and accessible to the public at least by October 21, 2008.

VI. DOCUMENT 2: EXHIBIT 1010 (“STOWERS 2009”)

51. Exhibit 1010 is a copy of the journal article titled “High Resolution, High Sensitivity Inorganic Resists” by Jason Stowers and Douglas A. Keszler (hereafter “Stowers 2009”). The Stowers 2009 article was published in Volume 86, Issues 4-6 of the journal *Microelectronic Engineering* and was found in the Linda Hall Library of Science, Engineering & Technology (Kansas City, Missouri). The Stowers 2009 article appears beginning on page 730 of this issue dated April-June 2009. Exhibit 1010 is a true and correct copy of the Stowers 2009 article (pages 730-733) that I understand is being submitted as an exhibit in this proceeding. Specifically, the text of the article is complete; no pages are

missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. The Stowers 2009 article is available from the publisher, Science Direct,¹⁸ the *ACM Digital Library*,¹⁹ and the digital repository *Semanti Scholar*.²⁰ The publisher lists an online publication date of December 3, 2008, and the *ACM Digital Library* indicates a publication date of April 1, 2009. Exhibit 1010 is a true and correct copy in a condition that creates no suspicion about its authenticity.

52. Attached hereto as Attachment 2A is a true and correct copy of the MARC record for the journal *Microelectronic Engineering* at the Linda Hall Library of Science, Engineering & Technology. Library ownership is indicated by the presence of the library's code (LHL) in field 049. The library continues to update this MARC record and enhanced the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 2A occurred on October 30, 2019, as shown in field 005 ("20191030"). I personally identified and retrieved the MARC record that is Attachment 2A.

53. Based on finding a print copy of Exhibit 1008 in the Linda Hall Library of Science, Engineering & Technology and MARC record in its online

¹⁸ <https://www.sciencedirect.com/science/article/abs/pii/S0167931708005674>

¹⁹ <https://dl.acm.org/doi/abs/10.1016/j.mee.2008.11.034>

²⁰ <https://www.semanticscholar.org/paper/High-resolution%2C-high-sensitivity-inorganic-resists-Stowers-Keszler/539e139eddbbc26d9b82c987f97c7892c07b4e47>

library catalog attached as Attachment 2A, it is my opinion that the Stowers 2009 article published in the journal *Microelectronic Engineering* was publicly available on or shortly after December 3, 2008, as indicated on the publisher's website. Attachment 2A also shows that Exhibit 1008 was catalogued with two descriptor terms reading "Semiconductors \$x Design and construction \$v Periodicals" (see Attachment 2B, Library of Congress subject heading sh85119903, Attachment 2C, Library of Congress subject heading sh87005579, and Attachment 2D, Library of Congress subject heading sh85099890) and "Semiconductor industry \$v Periodicals" (see Attachment 2E, Library of Congress subject heading sh85119894 and Attachment 2D, Library of Congress subject heading sh85099890) in the 650 fields.

54. As noted in the holdings information (362 field), the Linda Hall Library of Science, Engineering & Technology has received the journal *Microelectronic Engineering* since September 1983 and continues to receive the publication. In view of the MARC record for Exhibit 1008, the Stowers 2009 article was publicly on or shortly after December 3, 2008, because the serial title had been received, cataloged, and indexed at the Linda Hall Library of Science, Engineering & Technology and made part of its online catalog database.

55. Attached hereto as Attachment 2F is a true and correct copy of the MARC record for the journal *Microelectronic Engineering* obtained from the

OCLC bibliographic database. As previously noted, the library that created the record is recorded in field 040 with a unique library code. For Attachment 2F, that library code is “GZM,” which means that the MARC record for this serial was cataloged at the University of Wisconsin – Madison Libraries. As can be seen in the “Entered” field in the MARC record for this exhibit, a cataloger at the University of Wisconsin – Madison Libraries created OCLC record number 10329408 on January 23, 1984, as shown in the “Entered” field (“19840123”). The library continues to update this MARC record and enhanced the MARC record to meet current cataloging rules. The most recent enhancement to Attachment 2F occurred on August 10, 2022, as shown in the “Replaced” field (“20220810”). I personally identified and retrieved the MARC record that is Attachment 2F. The “BLvl” entry in Attachment 2F is “s,” which indicates that the journal *Microelectronics Engineering* is a serial publication. Field 310 of Attachment 2F reads “Four or five vols a year, \$b <2002-.” Accordingly, the MARC record for Exhibit 1008 corresponds to the journal *Microelectronics Engineering* from the time the serial title began and includes the date of the Stowers 2009 article.

56. Attachment 2F includes an entry in field 050 (“TK7871.85 \$b .M516”)—as described above, a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“621.381/52”), a subject

matter consistent with the Dewey Decimal classification system. Attachment 2F includes four descriptor terms reading “Semiconductors \$x Design and construction \$v Periodicals” (see Attachment 2B, Library of Congress subject heading sh85119903, Attachment 2C, Library of Congress subject heading sh87005579, and Attachment 2D, Library of Congress subject heading sh85099890), “Semiconductor industry \$v Periodicals” (see Attachment 2E, Library of Congress subject heading sh85119894 and Attachment 2D, Library of Congress subject heading sh85099890), “Microelectronics \$v Periodicals” (see Attachment 2G, Library of Congress subject heading sh2010101675), and “Nanoelectronics \$v Periodicals” (see Attachment 2H, Library of Congress subject heading sh2006009047 and Attachment 2D, Library of Congress subject heading sh85099890) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 2B was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. As of January 23, 1984, the MARC record attached hereto as Attachment 2F was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that subscribed to the serial, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an

individual library.

57. Attachment 2F indicates that the journal *Microelectronic Engineering* as cataloged at the University of Wisconsin – Madison Libraries is currently available from 106 libraries. In view of the above, this issue of the journal *Microelectronic Engineering* was publicly available on or shortly after November 1, 2005, because by that date it had been cataloged and indexed at the University of Wisconsin – Madison Libraries, made part of the OCLC bibliographic database, and received at the Linda Hall Library of Science, Engineering & Technology.

58. For these reasons, it is my opinion that Exhibit 1008 was published and accessible to the public at least by December 3, 2008.

VII. DOCUMENT 3: EXHIBIT 1024 (“TRIKERIOTIS”)

59. Attached hereto is a true and correct copy of the conference paper titled “Development of an Inorganic Photoresist for DUV, EUV, and Electron Beam Imaging” by Markos Trikeriotis, Woo Jin Bae, Evan Schwartz, Marie Krysak, Neal Lafferty, Peng Xie, Bruce Smith, Paul Zimmerman, Christopher K. Ober, and Emmanuel P. Giannelis (hereafter “Trikeriotis”). This conference paper was published in the two-part *Proceedings of SPIE -- the International Society for Optical Engineering*, volume 7639 in part 1 on pages 7639OE-1—7639O3-10. The SPIE conference was titled Advances in Resist Materials and Processing

Technology XXVII and was held on February 22-24, 2010, in San José, California. The exhibit filed in this proceeding as Exhibit 1024 is a true and correct copy of the conference paper. I obtained this copy of the article from the Library of Congress. Specifically, the text of the conference paper is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1024 was found within the custody of a library – a place where, if authentic, a copy of this proceedings volume would likely be. Exhibit 1024 is a true and correct copy in a condition that creates no suspicion about its authenticity.

60. The Trikeriotis paper is available and can be downloaded from the International Society for Optical Engineering (SPIE) website²¹ and the digital repositories *ResearchGate*²² and *Semantic Scholar*.²³ The SPIE website indicates a March 25, 2010, publication date.

²¹ <https://www.spiedigitallibrary.org/conference-proceedings-of-spie/7639/76390E/Development-of-an-inorganic-photoresist-for-DUV-EUV-and-electron/10.1117/12.846672.short?SSO=1>

²²

https://www.researchgate.net/publication/241507722_Development_of_an_inorganic_photoresist_for_DUV_EUV_and_electron_beam_imaging

²³ <https://www.semanticscholar.org/paper/Development-of-an-inorganic-photoresist-for-DUV%2C-Trikeriotis-Bae/06ada211e9aae3a4cc0687c72ecb125382bd26e4>

61. Attached hereto as Attachment 3A is a true and correct copy of the MARC record for the two-part *Proceedings of SPIE -- the International Society for Optical Engineering*, volume 7639 from the Library of Congress online catalog. Library ownership is indicated by the presence of the library's code ("DLC") in the 040 field. I personally identified and retrieved the MARC record that is Attachment 3A.

62. Attachment 3A shows that the two-part *Proceedings of SPIE -- the International Society for Optical Engineering*, volume 7639 was cataloged at the Library of Congress on September 9, 2010, and the cataloging process was completed on September 21, 2010, as shown in field 955. Therefore, this volume was publicly available to users at the Library of Congress on that date.

63. Attached hereto as Attachment 3B is a true and correct copy of the MARC record for two-part volume 7639 of the *Proceedings of SPIE -- the International Society for Optical Engineering* obtained from the OCLC bibliographic database. This MARC record is OCLC record number 663822515. Attachment 3B indicates that volume 7639 of the *Proceedings of SPIE -- the International Society for Optical Engineering* was cataloged by the Library of Congress on September 9, 2010. In view of Attachment 3B, the two-part volume 7639 of the *Proceedings of SPIE -- the International Society for Optical Engineering* was publicly available on or shortly after September 21, 2010,

because by that date it had been received, cataloged, and indexed at the Library of Congress and made part of the OCLC bibliographic database.

64. Attachment 3B further includes an entry in field 050 (“TK7874 \$b .A3375 2010”)—as described above, this includes a subject matter classification number consistent with the Library of Congress classification system (analogous to the Dewey Decimal classification system) and an entry in field 082 (“621.3815/31”), a subject matter consistent with the Dewey Decimal classification system. Attachment 3B further includes two descriptor terms reading “Photoresists \$v Congresses” (see Attachment 3C, Library of Congress subject heading sh2010106194) and “Microlithography \$v Congresses” (see Attachment 3D, Library of Congress subject heading sh2008107753) in the 650 fields. Thus, as of its cataloging, the publication corresponding to the MARC record attached hereto as Attachment 3B was indexed according to its subject matter by virtue of at least three independently sufficient classifications: the field 050 entry, the field 082 entry, and the field 650 entries. Further, as of September 21, 2010, the MARC record attached hereto as Attachment 3B was accessible through any library with access to the OCLC bibliographic database or the online catalog at a library that purchased this volume, which means that the corresponding publication was publicly available on or before that same date through any library with access to the OCLC bibliographic database or through an individual library.

65. Further supporting my opinion that Exhibit 1024 was publicly accessible to ordinarily skilled and interested researchers in the field is the fact that the two-part conference proceedings volume titled *Advances in Resist Materials and Processing Technology XXVII* was registered with the U. S. Copyright Office as item TX0007198710 on July 20, 2010, and indicated a publication date of March 3, 2010, (see Attachment 3E, U. S. Copyright Office Public Catalog). As noted above, this would have provided a POSITA with keyword searching capabilities and other tools to locate this two-part conference proceedings volume.

66. For these reasons, I find that Exhibit 1024 was published and accessible to the public at least by March 25, 2010.

VIII. SUMMARY OF OPINIONS

67. In view of the foregoing, it is my opinion that the publications described above were publicly available no later than the corresponding date listed in the table below:

Exhibit	Publication	Publicly Available At Least By
1008	Stowers, Jason K. <i>Direct Patterning of Solution Deposited Metal Oxides</i> . Dissertation. Department of Chemistry. Corvallis, OR: Oregon State University, 2008.	October 21, 2008

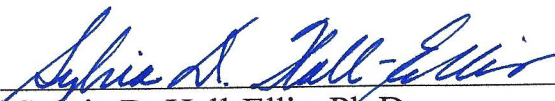
Exhibit	Publication	Publicly Available At Least By
1010	Stowers, Jason, and Douglas A. Keszler. "High Resolution, High Sensitivity Inorganic Resists." <i>Microelectronic Engineering</i> , vol. 86, issues 4-6 (April-June 2009): 730-733.	December 3, 2008
1024	Trikeriotis, Markos, Woo Jin Bae, Evan Schwartz, Marie Krysak, Neal Lafferty, Peng Xie, Bruce Smith, Paul Zimmerman, Christopher K. Ober, and Emmanuel P. Giannelis. "Development of an Inorganic Photoresist for DUV, EUV, and Electron Beam Imaging." <i>Advances in Resist Materials and Processing Technology XXVII</i> , edited by Robert D. Allen, Mark H. Somervell, Proceedings of SPIE Vol. 7639. 2 vols. Bellingham, WA: SPIE, ©2010.	March 25, 2010

68. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

69. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the

knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1034 of Title 18 of the United States Code.

DATED: October 11, 2023

By: 
Sylvia D. Hall-Ellis, Ph.D.

ATTACHMENT 1A

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001 99144947130001451
005 20230219213023.0
008 081021s2008 xx a bm 000 0 eng d
035 ##$a(OCOLC)263038762
035 ##$a(OCOLC)ocn263038762
040 ##$aORE $beng $cORE $dOCLCF $dUMI $dOCLCQ $dOCLCO $dOCLCQ $dOCL
049 ##$aMAIN
050 #4$aLD4330 2009D $bStowers, Jason K.
100 1#$aStowers, Jason K.
245 10$aDirect patterning of solution deposited metal oxides / $cby
Jason K. Stowers.
260 ##$c©2008.
300 ##$a134 leaves : $billustrations (some color) ; $c29 cm
336 ##$atext $btxt $2rdacontent
337 ##$aunmediated $bn $2rdamedia
338 ##$avolume $bnc $2rdacarrier
530 ##$aAlso available on the World Wide Web.
520 3#$aPatterning of metal oxides typically involves a multi step
process, involving depositing a resist, patterning that resist with
some form of lithography, etching the oxide through the resist, and
finally removing. This process can be simplified if the resist is
removed and replaced with a metal oxide that can be directly
patterned. Solution deposition of metal oxides allows the possibility
of depositing materials that are responsive to traditional
lithographic patterning methods. A directly patterned resist can be
integrated into devices with less difficulty. It is also possible,
with a directly patterned metal oxide, to consider this material also
as a resist for the patterning of another material. This metal oxide
can then be considered an inorganic resist. Inorganic resists have
proven to offer a higher resolution and etch resistance than a
comparable polymer resist. The work presented here represents efforts
to develop directly patterned metal oxides that exhibits these desired
resist properties, but which also competes with polymer resist in
terms of sensitivity, the one area inorganic resists have always
performed unsuitably. An inorganic resist has been developed that
exhibits excellent performance in these important metrics, as well as
others which are required of state-of-the-art resists. This inorganic
resist has shown sensitivity to a variety of modern exposure sources.
The patterning chemistry which has been develop is adaptable to a
large number of metal oxides. Direct pattern of metal oxides also
offers potential for the modification of the material through solution
based or solid state methods in order to access a variety of material
properties not found in the initial metal oxide.
500 ##$aPrintout.
502 ##$bPh. D. $cOregon State University $d2009
504 ##$aIncludes bibliographical references.
650 #0$aMetallic oxides.
650 #0$aLithography, Electron beam.
650 #0$aPhotolithography.
650 #6$aOxydes métalliques.
650 #6$aLithographie par faisceau d'électrons.

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650      #6$aPhotolithographie.
650      #7$aphotolithography. $2aat
650      #7$aLithography, Electron beam. $2fast $0(OCOLC)fst01000292
650      #7$aMetallic oxides. $2fast $0(OCOLC)fst01017898
650      #7$aPhotolithography. $2fast $0(OCOLC)fst01062032
653      ##$aInorganic resist.
653      ##$aPhotolithography.
653      ##$aElectron Beam Lithography.
653      ##$aDirect patterning.
653      ##$aSolution deposited.
653      ##$aetal oxide.
655      #7$aAcademic theses. $2fast $0(OCOLC)fst01726453
655      #7$aAcademic theses. $2lcgft
690      ##$aTheses, OSU $xChemistry. $9LOCAL
856      41$uhttp://hdl.handle.net/1957/9543
856      42$3ProQuest, Abstract
$uhttp://gateway.proquest.com/openurl?url_ver=Z39.88-
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994      ##$a92 $bOACL

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ATTACHMENT 1B

OCLC 263038762 No holdings in XXX - 2 other holdings

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BLvl	m	Form		Conf	0
		Cont	bm	GPub	
Desc	a	Ills	a	Fest	0
				DtSt	s
				Dates	2008

040 ORE \$b eng \$c ORE \$d OCLCF \$d UMI \$d OCLCQ \$d OCLCO \$d OCLCQ \$d OCL

050 4 LD4330 2009D \$b Stowers, Jason K.

090 \$b

100 1 Stowers, Jason K.

245 10 Direct patterning of solution deposited metal oxides / \$c by Jason K. Stowers.

260 \$c ©2008.

300 134 leaves : \$b illustrations (some color) ; \$c 29 cm

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

500 Printout.

502 \$b Ph. D. \$c Oregon State University \$d 2009

520 3 Patterning of metal oxides typically involves a multi step process, involving depositing a resist, patterning that resist with some form of lithography, etching the oxide through the resist, and finally removing. This process can be simplified if the resist is removed and replaced with a metal oxide that can be directly patterned. Solution deposition of metal oxides allows the possibility of depositing materials that are responsive to traditional lithographic patterning methods. A directly patterned resist can be integrated into devices with less difficulty. It is also possible, with a directly patterned metal oxide, to consider this material also as a resist for the patterning of another material. This metal oxide can then be considered an inorganic resist. Inorganic resists have proven to offer a higher resolution and etch resistance than a comparable polymer resist. The work presented here represents efforts to develop directly patterned metal oxides that exhibits these desired resist properties, but which also competes with polymer resist in terms of sensitivity, the one area inorganic resists have always performed unsuitably. An inorganic resist has been developed that exhibits excellent performance in these important metrics, as well as others which are required of state-of-the-art resists. This inorganic resist has shown sensitivity to a variety of modern exposure sources. The patterning chemistry which has been develop is adaptable to a large number of metal oxides. Direct pattern of metal oxides also offers potential for the modification of the material through solution based or solid state methods in order to access a variety of material properties not found in the initial metal oxide.

530 Also available on the World Wide Web.

504 Includes bibliographical references.

650 0 Metallic oxides.

650 0 Lithography, Electron beam.

650 0 Photolithography.

650 6 Oxydes métalliques. \$0 (CaQQLa)201-0026030

650 6 Lithographie par faisceau d'électrons. \$0 (CaQQLa)201-0086589

650 6 Photolithographie. \$0 (CaQQLa)201-0058942

650 7 photolithography. \$2 aat \$0 (CStmoGRI)aat300053275
650 7 Lithography, Electron beam. \$2 fast \$0 (OCoLC)fst01000292
650 7 Metallic oxides. \$2 fast \$0 (OCoLC)fst01017898
650 7 Photolithography. \$2 fast \$0 (OCoLC)fst01062032
653 Inorganic resist.
653 Photolithography.
653 Electron Beam Lithography.
653 Direct patterning.
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MARC Display

Labelled Display

LC control no.: sh 85084122

LCCN Permalink: <https://lcn.loc.gov/sh85084122>

HEADING: Metallic oxides

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550 __ |w g |a Oxides

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953 __ |a xx00 |b ta25

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LCCN Permalink: <https://lcn.loc.gov/sh85077608>

HEADING: Lithography, Electron beam

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150 __ |a Lithography, Electron beam

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550 __ |w g |a Electron beams |x Industrial applications

550 __ |w g |a Microelectronics

550 __ |w g |a Photolithography

906 __ |t 8648 |u fk02 |v 0

953 __ |a xx00 |b fj11

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LC control no.: sh 85101379

LCCN Permalink: <https://lcn.loc.gov/sh85101379>

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008 860211|| anannbabn |b ana

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053 _0 |a TR940 |b TR950

150 __ |a Photolithography

550 __ |w g |a Lithography

550 __ |a Photomechanical processes

550 __ |a Photoresists

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ATTACHMENT 2A

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300 ##$av. : $bill. ; $c27 cm.
310 ##$aQuarterly
362 0#$aVol. 1, no. 1 (Sept. 1983)-
500 ##$aTitle from cover.
510 2#$aChemical abstracts $x0009-2258 $b1983-
515 ##$aSome nos. issued in combined form.
650 #0$aSemiconductors $xDesign and construction $vPeriodicals.
650 #0$aSemiconductor industry $vPeriodicals.
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901 ##$cSer
936 ##$aVol. 5, nos. 1-4 (Dec. 1986) LIC
945 ##$aMicroelectronic engineering. $bMicroelectronic
engineering.
948 ##$aLTI 07/20/2016

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LC control no.: sh 85119903

LCCN Permalink: <https://lcn.loc.gov/sh85119903>

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035 __ |a (DLC)7774440

035 __ |a (DLC)sp 85119903

035 __ |a (DLC)414934

040 __ |a DLC |c DLC |d DLC

150 __ |a Semiconductors

360 __ |i particular semiconducting substances, e.g. |a Germanium, Silicon; |i and headings beginning with the word |a Semiconductor

450 __ |a Crystalline semiconductors

450 __ |a Semi-conductors

450 __ |a Semiconducting materials

450 __ |a Semiconductor devices

550 __ |w g |a Crystals

550 __ |w g |a Electrical engineering |x Materials

550 __ |w g |a Electronics |x Materials

550 __ |a Solid state electronics

906 __ |t 0908 |u tc09 |v 0

953 __ |a xx00 |b td13

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LCCN Permalink: <https://lcn.loc.gov/sh87005579>

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035 __ |a (DLC)sh 87005579

035 __ |a (DLC)157414

040 __ |a DLC |c DLC |d DLC

150 __ |a Design and construction

260 __ |i subdivision |a Design and construction |i under individual examinations and types of examinations and under types of structures, machines, equipment, etc., for works discussing their engineering, and/or construction, e.g. |a Automobiles--Design and construction

906 __ |t 8846 |u fk03 |v 0

952 __ |a 0 bib. record(s) to be changed

953 __ |a fj26 |b fj26

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040 __ |a DLC |c DLC |d DLC

053 _0 |a AP |c General periodicals

053 _0 |a PN4700 |b PN5650 |c History

150 __ |a Periodicals

360 __ |i subdivision |a Periodicals |i under specific subjects, e.g. |a Engineering--Periodicals; United States--History--Periodicals

450 __ |a Journals (Periodicals)

450 __ |a Magazines

550 __ |w g |a Library materials

550 __ |w g |a Mass media

550 __ |w g |a Serial publications

550 __ |a Newspapers

550 __ |a Press

670 __ |a UMI business vocab. |b (Journals)

680 __ |i Here are entered works on the periodicals of the world and, with appropriate subdivisions, works on special aspects or sections of periodicals. Works on periodicals in a specific language, or in a specific country or larger area, are entered under the adjectival form of the language or area, e.g. |a Arabic periodicals; Canadian periodicals.

906 __ |t 0420 |u te03 |v 0

910 __ |a Proposal saved by tc03 on 05/14/2012 at 17:15:30

953 __ |a xx00 |b td14

906 __ |t 1206 |v 0

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040 __ |a DLC |c DLC |d DLC

053 _0 |a HD9696.S4 |b HD9696.S44 |c Economics

150 __ |a Semiconductor industry

550 __ |w g |a Electronic industries

680 __ |i Here are entered works on the industry that manufactures all types of semiconductors. Works on the industry that manufactures semiconductor devices used in industrial applications are entered under |a Semiconductor industrial equipment industry. |i Works on the industry that manufactures equipment for the production of semiconductor devices are entered under |a Semiconductor production equipment industry.

681 __ |i Notes under |a Semiconductor industrial equipment industry; Semiconductor production equipment industry

906 __ |t 8833 |u fk04 |v 0

953 __ |a xx00 |b fe12

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082 00 621.381/52 \$2 20

090 \$b

210 0 Microelectron. eng.

222 0 Microelectronic engineering

245 00 Microelectronic engineering.

260 Amsterdam : \$b North-Holland ; \$a Tokyo : \$b OHMSHA, \$c 1983-

300 volumes : \$b illustrations ; \$c 27 cm

310 Four or five vols. a year, \$b <2002-

321 Quarterly, \$b 1983-

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

362 0 Vol. 1, no. 1 (Sept. 1983)-

500 Title from cover.

500 Published: Amsterdam : Elsevier, <2009-

510 2 Chemical abstracts \$x 0009-2258 \$b 1983-

515 Some nos./vols. issued in combined form.

530 Also issued online.

588 Latest issue consulted: Vol. 86, issue 2 (Feb. 2009).

650 0 Semiconductors \$x Design and construction \$v Periodicals.

650 0 Semiconductor industry \$v Periodicals.

650 0 Microelectronics \$v Periodicals.

650 0 Nanoelectronics \$v Periodicals.

650 7 Microelectronics. \$2 fast \$0 (OCoLC)fst01019757

650 7 Nanoelectronics. \$2 fast \$0 (OCoLC)fst01741867
650 7 Semiconductor industry. \$2 fast \$0 (OCoLC)fst01112134
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776 08 \$i Online version: \$t Microelectronic engineering (Online) \$w (DLC) 2005233292 \$w
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850 CSt \$a CU \$a CU-A \$a CU-I \$a CU-S \$a CU-SB \$a CaAEU \$a DLC \$a DeU \$a GAT \$a IEN \$a IU \$a IaAS
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856 41 \$u <http://www.sciencedirect.com/science/journal/01679317>

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150 __ |a Microelectronics |v Periodicals

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670 __ |a Work cat.: Russian microelectronics,

906 __ |t 8888 |u tc00 |v 0

953 __ |a tc00

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150 __ |a Nanoelectronics

450 __ |a Nanoscale electronics

450 __ |a Nanoscale molecular electronics

550 __ |w g |a Electronics

550 __ |w g |a Nanotechnology

670 __ |a Work cat.: Nano- and micro-electromechanical systems : fundamentals of nano- and microengineering, 2005: |b p. 5 (emphasizing nanotechnology-based nanoelectronics as a core nanotechnology area, one can state that nanoelectronics is research that devises new atomic and molecular scale structures, devices and systems, and fabricate them to develop novel nanotechnologies for supercomplex nanoscale integrated circuits)

670 __ |a Macromolecular nanostructured materials, 2004: |b p. 2 (the rapidly developing practice of molecular electronics at the nanoscale level-- often referred to as nanoelectronics)

670 __ |a Computational electronics: semiconductor transport and device simulation, 1991: |b p. 183 ("In establishing nanoelectronics as a viable molecular electronics technology of the future, many new ... questions emerge concerning the physics and electronics on the submicron and ultrasubmicron dimensional scale ...")

670 __ |a Silicon quantum integrated circuits, 2005: |b p. 7 (Simply by shrinking the lateral dimensions into the sub-10nm and vertical into the sub-10nm region, existing microelectronics has been converted into nanoelectronics; this isn't the usual meaning of the term nanoelectronics to many researchers; it's more frequently used to describe new technologies such as molecules, wires, and other exotic structures on the nanometre scale)

670 __ |a New physics for the 21st century, 2006: |b p. 512 (The progress from
microelectronics toward nanoelectronics is a triumph of solid state physics; molecular
electronics is not yet close to the market)
906 __ |t 0704 |u te04 |v 0
952 __ |a 0 bib. record(s) to be changed
952 __ |a LC pattern: Microelectronics
953 __ |a yz00

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245	00 a Advances in resist materials and processing technology XXVII : b 22-24 February 2010, San Jose, California, United States / c Robert D. Allen, Mark H. Somervell, editors ; sponsored by SPIE ; cooperating organization, SEMATECH Inc. (United States).
260	__ a Bellingham, Wash. : b SPIE, \$c c2010.
300	__ a 2 v. (various pagings) : b ill. ; c 28 cm.
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504	__ a Includes bibliographical references.
650	_0 a Photoresists v Congresses.
650	_0 a Microlithography v Congresses.

700	1_	a Allen, Robert D.
700	1_	a Somervell, Mark Howell, d 1973-
710	2_	a SPIE (Society)
856	40	u http://link.spie.org/PSISDG/7639/1

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245 00 Advances in resist materials and processing technology XXVII : \$b 22-24 February 2010, San Jose, California, United States / \$c Robert D. Allen, Mark H. Somervell, editors ; sponsored by SPIE ; cooperating organization, SEMATECH Inc. (United States) ; published by SPIE.

246 3 Advances in resist materials and processing technology 27

260 Bellingham, Wash. : \$b SPIE, \$c ©2010.

300 2 volumes : \$b illustrations ; \$c 28 cm.

336 text \$b txt \$2 rdacontent

337 unmediated \$b n \$2 rdamedia

338 volume \$b nc \$2 rdacarrier

490 1 Proceedings of SPIE, \$x 0277-786X ; \$v v. 7639

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650 7 Photoresists. \$2 fast \$0 (OCoLC)fst01062099

655 7 Conference papers and proceedings. \$2 fast \$0 (OCoLC)fst01423772

700 1 Allen, Robert D.

700 1 Somervell, Mark Howell, \$d 1973-

710 2 SPIE (Society)

830 0 Proceedings of SPIE--the International Society for Optical Engineering ; \$v v. 7639.

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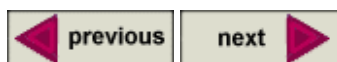
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