AD-A158 114 SEARCH AND RETRIEVAL INDEX TO EOS/ESD SYMPOSIUM PROCEEDINGS - 1979 TO 1984(U) RELIABILITY ANALYSIS CENTER GRIFFISS AFB NY R E RASH ET AL. 15 APR 85 1/2

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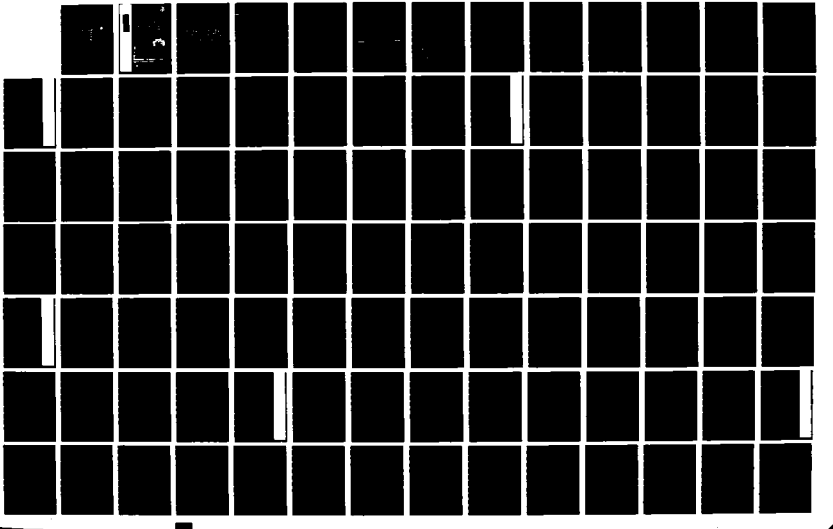

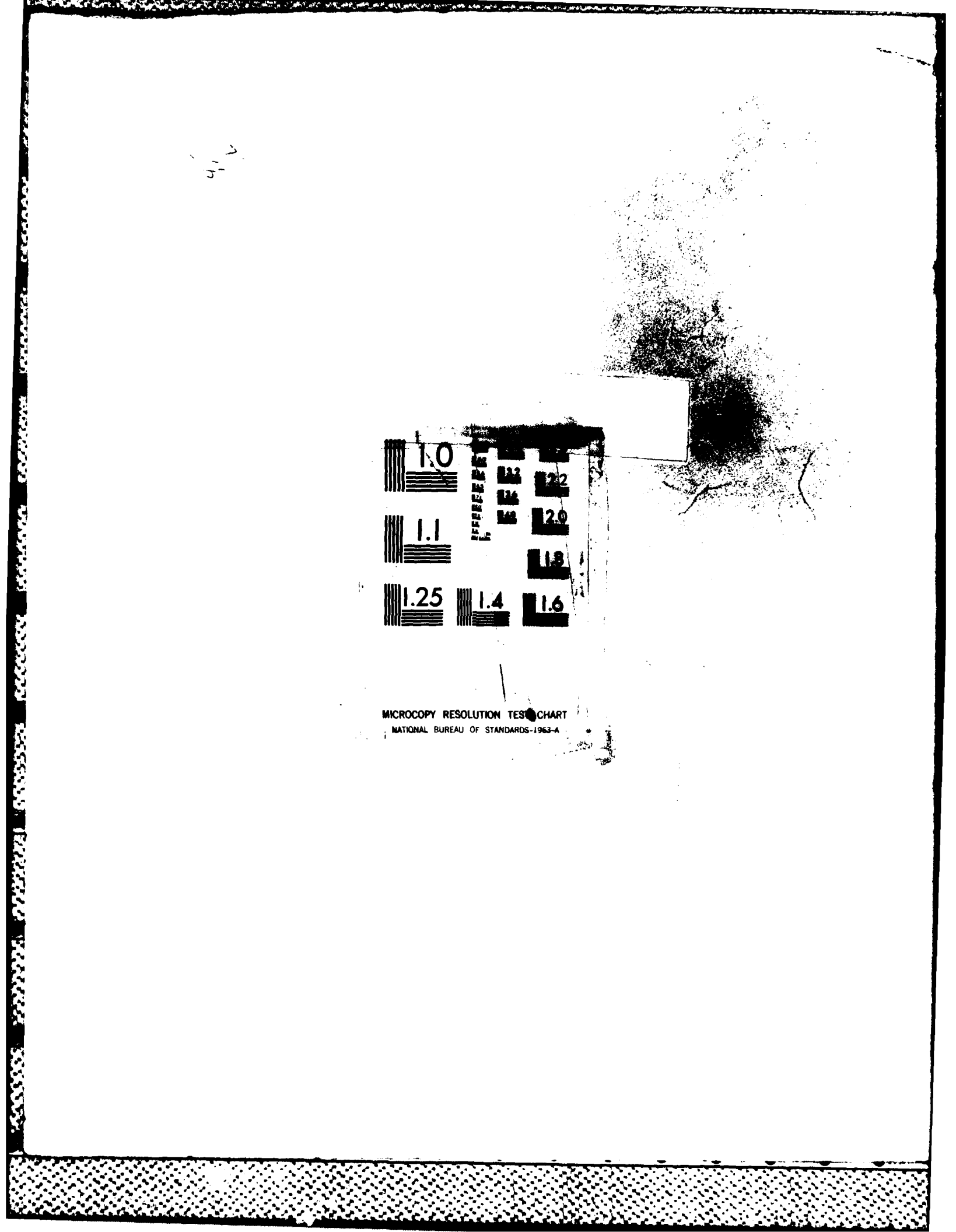
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Technical Reliability Studies

SEARCH and RETRIEVAL INDEX to RAC/ESD SYMPOSIUM PROCEEDINGS

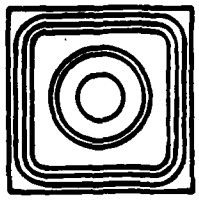
[illegible] to 1984

Spring 85

Reliability Analysis Center

ROME AIR DEVELOPMENT CENTER

THE RELIABILITY ANALYSIS CENTER IS A DoD INFORMATION ANALYSIS CENTER



Reliability Analysis Center
A DoD Information Analysis Center

Technical Reliability Studies

SEARCH and RETRIEVAL INDEX to EOS/ESD SYMPOSIUM PROCEEDINGS 1979 to 1984

Spring 85

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Under Contract To:

Rome Air Development Center
Griffiss AFB, NY 13441

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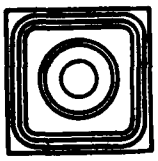

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The Reliability Analysis Center (RAC) is a Department of Defense Information Analysis Center sponsored by the Defense Logistics Agency, managed by the Rome Air Development Center (RADC), and operated at RADC by IIT Research Institute (IITRI). RAC is charged with the collection, analysis and dissemination of reliability information pertaining to parts used in electronic systems. The present scope includes integrated circuits, hybrids, discrete transistors and diodes, microwave devices, optoelectronics, and selected nonelectronic parts employed in military, space and commercial applications.

In addition, a System/Equipment Reliability Corporate Memory (RCM) is also operating under the auspices of the RAC and serves as the focal point for the collection and analysis of all reliability-related information and data on operating and planned military systems and equipment.

Data are collected on a continuous basis from a broad range of sources including testing laboratories, device and equipment manufacturers, government laboratories, and equipment users, both government and nongovernment. Automatic distribution lists, voluntary data submittal, and field failure reporting systems supplement an intensive data solicitation program.

Reliability data documents covering most of the device types mentioned above are available annually from RAC. Also, RAC provides reliability consulting and technical and bibliographic inquiry services which are fully discussed at the end of this document.

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Charles A. Cox
IITRI/Reliability Analysis Center
RADC/RAC
Griffiss Air Force Base, NY 13441-5700
Telephone: (315)330-4151
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ALL OTHER REQUESTS SHOULD BE DIRECTED TO:

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17. COSATI CODES			18. SUBJECT TERMS (*Continue on reverse if necessary and identify by block number*)			
FIELD	GROUP	SUB-GROUP	ESD	Classification	EMP	STTL
09	01		EOS	MNOS	ESD/EOS Controls	ASTTL
			Microcircuit	CMOS	NMOS	HCMOS

19. ABSTRACT (*Continue on reverse if necessary and identify by block number*)

This book contains indexes used in searching for information contained in papers produced in Electrical Overstress/Electrostatic Discharge (EOS/ESD) Symposium 1979 to 1984. These indexes are the Alphabetical List of Index Terms, Subject Index, Author Index, Corporate Index, Keywords in Title Index, and Chronological List of Papers Index. These indexes provide a clear, easy-to-read, and concise method of searching for and retreiving the valuable information contained in IRPS Proceedings.

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PREFACE

The Reliability Analysis Center is pleased to publish TRS-4, "The Search and Retrieval Index to EOS/ESD Symposium Proceedings From 1979 to 1984." TRS-4 provides quick and efficient access to EOS/ESD-related references.

The EOS/ESD Index makes more accessible present information on failure mechanisms, failure causes, and potential technology problems from electrical overstress/electrostatic discharge. The information from the documents in the Proceedings provides recommendations for circumventing or mitigating potential EOS/ESD problems and also provides references to evaluation and qualification testing. Increased information retrieval capability given by this index avoids duplication of previous studies and unreliable processes.

R. Wanner developed the software support programs, with input assistance from J. Race. D. Rash provided organization, coordination and control of processes under the supervision of W. Turkowski. W. Crowell defined extra EOS/ESD index terms for inclusion into this document. The entire RAC technical staff participated in the indexing of the documents contained in the EOS/ESD Symposium Proceedings.

TABLE OF CONTENTS

1.0 INTRODUCTION

The RAC developed "The Search and Retrieval Index to EOS/ESD Symposium Proceedings From 1979 to 1984" to provide ready access to current information on EOS/ESD-related topics.

Containing indexes plus users' guide material, this document serves as a reference to aid in the utilization of information concerning all aspects of electrical overstress/electrostatic discharge as presented in the EOS/ESD Symposium Proceedings. This structured index provides a quick and efficient access to references for a given topic. The increased information retrieval capability provided by this index prevents duplication of previous efforts and will help avoid the use of unreliable processes.

The EOS/ESD Symposium Proceedings are available from IIT Research Institute. Orders for EOS/ESD Symposium Proceedings should be directed to: Charles A. Cox, IITRI/Reliability Analysis Center, RADC/RAC, Griffiss Air Force Base, NY 13441-5700. To determine price and availability call (315) 330-4151, Autovon 587-4151.

2.0 IMPLEMENTATION

These indexes were composed by IITRI's Plexus P/60 computer using the UNIX Operating System. The manuscript was printed out on an Anderson Jacobson (Model AJ832) terminal.

3.0 INDEXING RATIONALE

For each paper in the Proceedings, two engineers with relevant expertise in that subject were assigned to independently read and index that article. The terms for these indexes were selected from a list of preselected index terms. The engineers' instructions included selecting those index terms for which the article had relevant information. To maintain flexibility in the index term list, periodic reviews and evaluations add new index terms.

4.0 ARRANGEMENT

This publication is arranged in six selections:

(1) Alphabetical Listing of Index Terms
(2) Subject Index
(3) Author Index
(4) Corporate Index
(5) Keyword in Title Index
(6) Chronological Paper Index

Each entry in each index uses the document accession number for location purposes in the RAC library. The document accession number also provides for traceability purposes to access abstracts which are not computerized.

The Alphabetical List of Index Terms, a 5-page list of terms without citations, serves as a lookup table for the subject index, which it precedes. The alphabetical list of terms identifies the category under which the index term appears by listing first the index term, then the categories for each index term, and then the number of documents for that index term within the category.

Index Term	Categories	Documents
Reliability	Design Considerations Semiconductor Technology	2
Reliability	Systems	5

This format allows the index term to remain generic while the categories narrow the focus to a single area of interest for the Subject Index. Using the Subject Index necessitates scanning these tables first to provide the following useful benefits: the researcher develops a search

strategy by (1) relevant association of subjects contained in the Alphabetical List of Terms with items of interest, (2) minimizing the likelihood of overlooking a highly relevant citation, and (3) constructing a source availability within the EOSs by the number of documents dealing with the item of interest.

The Subject Index alphabetically lists index terms from Section I with citations. The index terms and categories remain in this section except the categories follow the index term on the same line in brackets.

INDEX TERM - CATEGORY

DOCUMENT - SEQUENCE NUMBER	TITLE	YEAR	PAGE
Reliability	[Design Considerations, Semiconductor Technology]		
18214- 5	Latent ESD Failures	82	[41-48]

The citations include the RAC document accession number, the title of the paper and the paper number. Including the title provides a possibility for selecting the most conveniently appropriate papers and eliminating those not applicable without the necessity of looking up more information elsewhere. Skillful use of this index can lead to deeper insight into EOS/ESD phenomena and perhaps new discoveries from the cross-pollination of related studies.

The Author Index alphabetically lists authors cited in the EOS/ESD Proceedings, whether principal or secondary. For each paper up to three authors were identified as they appeared on the paper.

The Corporate Index alphabetically lists corporations, companies, institutions, and government agencies with whom the authors were affiliated at the time the papers were prepared. Citations in the index include paper number and title. For each paper only the first company that appeared on the paper was cited.

The Keyword in Title Index alphabetically lists selected keywords n the title of the paper. Citations include paper number and title. he use of this index locates papers for which the keyword is a rincipal topic.

The Chronological List of Papers lists by page and document ccession numbers the last paper of the 1984 Proceedings first, then the ollowing papers in descending numerical order until the first paper in he 1979 Proceedings appears as the last entry. Following each document ccession number appears the title of the paper, pages, author(s), their orporate affiliation, and an alphabetical list of all the index terms pplied to the particular paper. When an index of another section cites paper, a profile of the paper's content can be deduced from the index erms appearing within the chronological paper list. The categories of he index terms remain the same, except for occasional abbreviations.

.0 SEARCH EXAMPLE

The following example illustrates the use of Section 1, lphabetical List of Terms, and Section II, Subject Index:

Suppose we are interested in studying EOS Models. The possible erms for finding applicable citations, we decide, would be "Models," Modeling," and "Mathematical Models." Scanning Section I for these erms we find the following terms listed by relevant association:

Reliability Modeling Techniques
Models/Theory/Equations
Mathematical Analysis

When these terms are looked up in the Subject Index (Section II) he following citations are accepted for study:

79	126-132	82	56-61
79	133-139	82	62-70
81	132-138	82	76-81
82	19-33	84	136-143

By examining the index terms of the above list of papers as they appear in Section 6, Chronological List of Papers, an additional number of apparently applicable terms could be selected to obtain additional citations for further related study.

6.0 CONCLUSION

The Reliability Analysis Center published this document to provide a faster and more efficient method of searching for valuable information contained in the EOS/ESD Proceedings. The Reliability Analysis Center intended with this document, as with previous publications, to maintain up-to-date information on electrical overstress/electrostatic discharge implications for advanced technologies and to provide a knowledge base necessary to control EOS/ESD.

Section 2:

SUBJECT INDEX

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
TEST TECHNIQUES	TESTING TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	6
TEST TECHNIQUES FOR REL. ASSESSMENT	SEMICONDUCTOR TECHNOLOGY	28
TESTING TOOLS & TECHNIQUES	SEMICONDUCTOR TECHNOLOGY	21
THEORY OF OPERATION	SEMICONDUCTOR TECHNOLOGY	6
THERMAL	TEST STRESS	4
THERMAL SECONDARY BREAKDOWN	ESD DEVICE FAILURE MODES	8
THERMAL STRESS/STRAIN	MECHANICAL & PHYSICAL FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	1
TOLERANCES	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	3
TOPICAL ANTISTATS	ESD MATERIALS AND EQUIPMENT PROTECTIVE	5
TRADE-OFFS	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	4
TRANSIENT SUPPRESSORS	ESD DEVICE PROTECTIVE DEVICES/INPUT PROTECTION	11
TRANSISTOR	DISCRETE SEMICONDUCTOR SEMICONDUCTOR DEVICE	13
TRIOBOELECTRIC CHARGING	ESD EOS/ESD PHYSICS	19
TTL	BIPOLAR COMPONENT TYPE	2
VOLUME RESISTIVITY	ESD MATERIALS AND EQUIPMENT TESTING	1
WEAPONS	EQUIPMENT TYPE/FUNCTION	1
WEIBULL	STATISTICAL ANALYSIS	2
WORKMANSHIP	FAILURE CAUSE FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	1
WRIST STRAP	ESD MATERIALS AND EQUIPMENT PROTECTIVE	6
WUNSCH BELL MODEL	ESD DEVICE TESTING METHODS	13

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
QUALITY ASSURANCE	SYSTEMS	8
REFERENCE DOCUMENT		47
REL. STANDARDS	USER OF REL. PREDICTION MODELS	1
RELATIVE HUMIDITY	ESD MATERIALS AND EQUIPMENT PROTECTIVE TECHNIQUES	21
RELIABILITY	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	2
RELIABILITY	SYSTEMS	5
RELIABILITY MANAGEMENT TECH	USER OF REL. PREDICTION MODELS	1
RELIABILITY MODELING TECHNIQUES	RELIABILITY MODELS/DATA/ANALYSIS	4
RESISTOR	PASSIVE DEVICE COMPONENT TYPE	4
REVERSE BREAKDOWN	ELECTRICAL FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	1
SCREENING	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	2
SECONDARY BREAKDOWN	ELECTRICAL FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	15
SEMICONDUCTOR DEVICE		14
SENSITIVE ELECTRONIC DEVICE SYMBOLS	ESD MATERIALS AND EQUIPMENT PROTECTIVE	2
SILICON	SEMICONDUCTOR TECHNOLOGY	1
SPACE	APPLICATION ENVIRONMENT	1
SPECIFICATION/STANDARD	REFERENCE DOCUMENT	5
STATIC CONTROL	ESD MATERIALS AND EQUIPMENT PROTECTIVE TECHNIQUES	20
STATISTICAL ANALYSIS		2
STEP STRESS	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	5
SURFACE RESISTIVITY	ESD MATERIALS AND EQUIPMENT TESTING	15
SYSTEM	LEVEL OF ASSEMBLY	3
TEST EQUIPMENT	TESTING TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	8
TEST PROGRAM DEVELOPMENT	TESTING TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	8
TEST SPECIFICATION	TESTING TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	6

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
MISC. FAILURE PHENOMENA	SEMICONDUCTOR TECHNOLOGY	2
MISSILE	APPLICATION ENVIRONMENT	1
MNOS	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	1
MODELS/THEORY/EQUATIONS	RELIABILITY MODELING TECHNIQUES RELIABILITY MODELS/DATA/ANALYSIS	6
MOISTURE	TEST STRESS	1
MOSFET	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	2
MOSFET C	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	3
MOSFET N	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	1
NONELECTRONICS		2
NOTICE/BULLETIN	REFERENCE DOCUMENT	1
OPERATIONAL TEST	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	2
OVERSTRESS	FAILURE CAUSE FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	45
OXIDATION	CHEMICAL FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	7
PACKAGE	SEMICONDUCTOR TECHNOLOGY	6
PKG BODY MATERIAL	PACKAGE SEMICONDUCTOR TECHNOLOGY	1
PKG ENCAPSULANT	PACKAGE SEMICONDUCTOR TECHNOLOGY	1
PKG LID OR COVER	PACKAGE SEMICONDUCTOR TECHNOLOGY	1
PROCESS CONTROL/SPECIFICATION	FABRICATION PROCESSES & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	6
PROCESS DESIGN	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	3
PROCESS/WORKMANSHIP INDUCED	MISC. FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	1
PROCUREMENT CONTROLS	USER OF REL. PREDICTION MODELS	3
PROTECTED ESD AREA	ESD MATERIALS AND EQUIPMENT PROTECTIVE	12
PROTECTIVE BAGS	ESD MATERIALS AND EQUIPMENT PROTECTIVE	8
PROTECTIVE WORK BENCH SURFACE	ESD MATERIALS AND EQUIPMENT PROTECTIVE	6

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
FMEA/FMECA,(FAILURE MODE EFFECTS)	RELIABILITY MODELING TECHNIQUES RELIABILITY MODELS/DATA/ANALYSIS	1
FUTURE TRENDS	SEMICONDUCTOR TECHNOLOGY	9
GEOMETRIES/LAYOUT	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	4
GRAPHICAL TECHNIQUES	RELIABILITY MODELING TECHNIQUES RELIABILITY MODELS/DATA/ANALYSIS	1
GROUNDING METHODS	ESD MATERIALS AND EQUIPMENT PROTECTIVE TECHNIQUES	6
GROUNDING STRAPS	ESD MATERIALS AND EQUIPMENT PROTECTIVE	6
GUIDE/PROCEDURE	REFERENCE DOCUMENT	24
HELICOPTOR	APPLICATION ENVIRONMENT	1
HUMAN BODY ESD MODEL	ESD DEVICE TESTING METHODS	21
HUMAN FACTORS	SYSTEMS	3
INDUCTIVE CHARGING	ESD EOS/ESD PHYSICS	3
INPUT PROTECTION	ESD DEVICE PROTECTIVE DEVICES/INPUT PROTECTION	16
JFET	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	1
LATENT ESD FAILURE	ESD DEVICE FAILURE MODES	4
LIFE	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	4
LOGISTICS	SYSTEMS	1
MAINTAINABILITY TECHNIQUES	MAINTAINABILITY SYSTEMS	1
MATERIALS	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	11
MATHEMATICAL ANALYSIS		12
METALLIZATION MELT	ESD DEVICE FAILURE MODES	13
METALLURGICAL FAILURE PHENOMENA	SEMICONDUCTOR TECHNOLOGY	1
MICROCIRCUIT	SEMICONDUCTOR DEVICE	33
MICROWAVE	DISCRETE SEMICONDUCTOR SEMICONDUCTOR DEVICE	1

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
ELECTROSTATIC SIMULATOR	ESD DEVICE TESTING METHODS	6
EMC - ELECTROMAGNETIC COMPATIBILITY	ESD EOS/ESD PHYSICS	1
EMI - ELECTROMAGNETIC INTERFACE	ESD EOS/ESD PHYSICS	10
EMP - ELECTROMAGNETIC PULSE	ESD EOS/ESD PHYSICS	17
ENVIRONMENTAL	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	2
EOS - ELECTRICAL OVERSTRESS	ESD EOS/ESD PHYSICS	23
EOS/ESD	SEMICONDUCTOR TECHNOLOGY	179
ESD CONTROL PROGRAM	ESD MATERIALS AND EQUIPMENT PROTECTIVE TECHNIQUES	20
ESD PROTECTIVE MATERIAL	ESD MATERIALS AND EQUIPMENT TESTING	20
ESD STD AND HANDBOOK	ESD STANDARDS, HANDBOOKS, MANUALS	21
ESD SUSCEPTIBILITY TESTING	ESD DEVICE TESTING METHODS	80
EVALUATION TEST	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	6
FABRICATION EQUIPMENT	FABRICATION PROCESSES & TECHNIQES SEMICONDUCTOR TECHNOLOGY	2
FABRICATION PROCESSES & TECHNIQUES	SEMICONDUCTOR TECHNOLOGY	10
FAILURE ANALYSIS RESULTS	FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	16
FAILURE ANALYSIS TECHNIQUES	FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	2
FAILURE CAUSE	FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	3
FAILURE CHARACTERIZATION	SEMICONDUCTOR TECHNOLOGY	7
FAILURE INDICATOR	FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	2
FAILURE MODES	FAILURE ANALYSIS SEMICONDUCTOR TECHNOLOGY	8
FIELD EFFECT,(FET)	SEMICONDUCTOR TECHNOLOGY	2
FLOOR SURFACE	ESD MATERIALS AND EQUIPMENT PROTECTIVE	5

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
COMPUTERIZED ANALYSIS	DESIGN TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	2
COMPUTERIZED TECH	RELIABILITY MODELING TECHNIQUES RELIABILITY MODELS/DATA/ANALYSIS	6
CONDUCTIVE ESD PROTECTIVE MATERIAL	ESD MATERIALS AND EQUIPMENT PROTECTIVE	7
CONDUCTIVE FOAM	ESD MATERIALS AND EQUIPMENT PROTECTIVE	2
CONTAMINATION	MISC. FAILURE PHENOMENA SEMICONDUCTOR TECHNOLOGY	2
CONTROL	EQUIPMENT TYPE/FUNCTION	3
COST	SYSTEMS	5
DATA COLLECTION SYS./TECHNIQUES	RELIABILITY MODELS/DATA/ANALYSIS	1
DECAY TIME	ESD MATERIALS AND EQUIPMENT TESTING	21
DESIGN CONSIDERATIONS	SEMICONDUCTOR TECHNOLOGY	12
DESIGN FOR TESTABILITY	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	16
DETECTOR/SENSOR	OPTOELECTRONIC SEMICONDUCTOR DEVICE	1
DEVELOPMENT PROGRAM	SEMICONDUCTOR TECHNOLOGY	12
DIELECTRIC BREAKDOWN	ESD DEVICE FAILURE MODES	8
DIGITAL LSI	MICROCIRCUIT SEMICONDUCTOR DEVICE	7
DIODE	DISCRETE SEMICONDUCTOR SEMICONDUCTOR DEVICE	7
DIP TUBE	ESD MATERIALS AND EQUIPMENT PROTECTIVE	3
DISCRETE SEMICONDUCTOR	SEMICONDUCTOR DEVICE	7
ELECTRICAL	TEST STRESS	4
ELECTRICAL FAILURE PHENOMENA	SEMICONDUCTOR TECHNOLOGY	4
ELECTRO-THERMOMIGRATION	ESD DEVICE FAILURE MODES	2
ELECTROSTATIC CHARGE DETECTOR	ESD MATERIALS AND EQUIPMENT PROTECTIVE	7
ELECTROSTATIC SHIELD	ESD EOS/ESD PHYSICS	3

ALPHABETICAL LISTING OF INDEX TERMS

INDEX TERM	CATEGORIES	DOCUMENTS
AIR IONIZER	ESD MATERIALS AND EQUIPMENT PROTECTIVE	10
ANTISTATIC GARMENTS	ESD MATERIALS AND EQUIPMENT PROTECTIVE	1
ANTISTATIC IMPREGNATED PLASTIC	ESD MATERIALS AND EQUIPMENT PROTECTIVE	1
APPLICATION FACTORS	DESIGN CONSIDERATIONS SEMICONDUCTOR TECHNOLOGY	10
ASSEMBLY & EQUIPMENT ESD CLASSIFICATION	ESD DEVICE TESTING METHODS	2
AVAILABILITY	SYSTEMS	1
BIPOLAR	COMPONENT TYPE	5
BIPOLAR & FET,(BIFET,BIMOS,ETC)	COMPONENT TYPE	1
BOARD	LEVEL OF ASSEMBLY	2
BULK CONDUCTIVE PLASTIC	ESD MATERIALS AND EQUIPMENT PROTECTIVE	2
CAPACITOR	PASSIVE DEVICE COMPONENT TYPE	2
CCD	FIELD EFFECT,(FET) SEMICONDUCTOR TECHNOLOGY	1
CHARACTERIZATION	TEST TECHNIQUES FOR REL. ASSESSMENT SEMICONDUCTOR TECHNOLOGY	5
CHARGE DEVICE MODEL	ESD DEVICE TESTING METHODS	10
CHART/DIAGRAM	REFERENCE DOCUMENT	1
CIRCUIT BOARD	NON-ELECTRONICS	3
CIRCUIT BREAKER	CIRCUIT PROTECTION DEVICES NON-ELECTRONICS	1
CIRCUIT PROTECTION DEVICES	NON-ELECTRONICS	15
CLEAN ROOM	ESD MATERIALS AND EQUIPMENT PROTECTIVE	1
COMPONENT	LEVEL OF ASSEMBLY	5
COMPUTATION	EQUIPMENT TYPE/FUNCTION	1
COMPUTER AIDED DESIGN,(CAD)	DESIGN TOOLS & TECHNIQUES SEMICONDUCTOR TECHNOLOGY	3
COMPUTERIZED	DATA COLLECTION SYS./TECHNIQUES RELIABILITY MODELS/DATA/ANALYSIS	3

Section 1:

ALPHABETICAL LISTING OF TERMS

INDEX TERM-CATEGORY

DOCUMENT-SEQUENCE NO.	TITLE	YEAR	PAGES
EOS/ESD [SEMICONDUCTOR TECHNOLOGY]			
18305-12	AN EXPERIMENTAL STUDY OF THE ESD SCREENING EFFECTIVENESS OF ANTI-STATIC BAGS	84	[78-84]
18305-13	A MATERIAL EVALUATION PROGRAM FOR DECORATIVE STATIC CONTROL TABLE TOP LAMINATES	84	[85-93]
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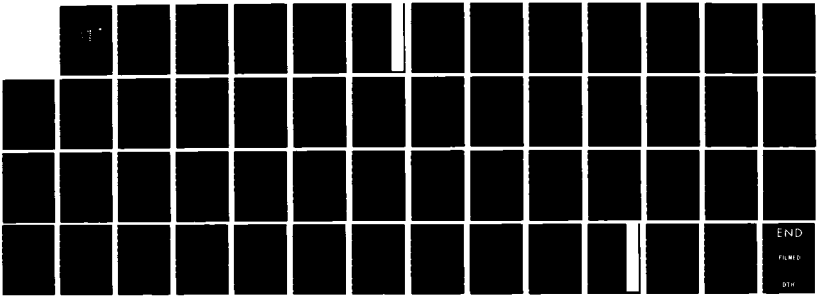

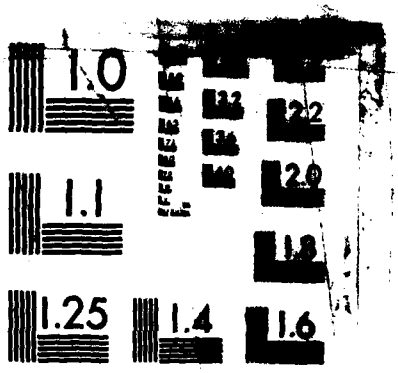

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AUTHOR(S) : RICHARDSON,L. SIMCOE,R. CHI,K.
COMPANY : DIGITAL EQUIPMENT CORPORATION (DEC)

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]

18305-26 ESD SENSITIVITY AND LATENCY EFFECTS OF SOME HCMOS INTEGRATED CIRCUITS [196-201]
AUTHOR(S) : CROCKETT,R.G.M. SMITH,J.G. HUGHES,J.F.
COMPANY : UNIVERSITY OF SOUTHAMPTON

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
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MOSFET C	[FIELD EFFECT,(FET), SEMICONDUCTOR TECH.]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
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18305-25 A FAILURE ANALYSIS METHODOLOGY FOR REVEALING ESD DAMAGE TO INTEGRATED CIRCUITS [189-195]
AUTHOR(S) : TAYLOR,R.G. WOODHOUSE,J. FEASEY,P.R.
COMPANY : BRITISH TELECOM

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ELECTRO-THERMOMIGRATION	[ESD, DEVICE, FAILURE MODES]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
MOSFET C	[FIELD EFFECT,(FET), SEMICONDUCTOR TECH.]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

18305-24 DEVICE ESD SUSCEPTIBILITY TESTING AND DESIGN HARDENING [179-188]
AUTHOR(S) : DECHIARO,L.F.
COMPANY : BELL LABORATORIES

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OXIDATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE MODES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE ANALYSIS TECHNIQUES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
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18305-23 DEGRADATION BY ESD TRANSIENTS OF THE SUBSTRATE BIAS VOLTAGE OF NMOS 8085-TYPE MICROPROCESSORS [165-178]
AUTHOR(S) : SHAW,R.N. ENOCH,R.D. TAYLOR,R.G.
COMPANY : BRITISH TELECOM

INDEX TERM	CATEGORIES
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EOS/ESD	[SEMICONDUCTOR TECH.]
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METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
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ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

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18305-22 DETERMINATION OF THRESHOLD ENERGIES AND DAMAGE MECHANISMS IN SEMICONDUCTOR DEVICES SUBJECTED TO VOLTAGE TRANSIENTS [157-164]
AUTHOR(S) : ROBERTS,B.C.
COMPANY : ERA TECHNOLOGY, LTD.

INDEX TERM	CATEGORIES
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MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

18305-21 AN EVALUATION OF EOS FAILURE MODELS [144-156]
AUTHOR(S) : PIERCE,D.G. PERILLAT,J. SHILEY,W.L.
COMPANY : BOOZ, ALLEN & HAMILTON

INDEX TERM	CATEGORIES
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EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
MOSFET C	[FIELD EFFECT,(FET), SEMICONDUCTOR TECH.]
TRANSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

18305-20 PROTECTION OF COMPONENTS AGAINST ELECTRICAL OVERSTRESS (EOS) AND TRANSIENTS IN MONITORS [136-143]
AUTHOR(S) : FOERSTER,G.
COMPANY : RCA

INDEX TERM	CATEGORIES
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EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
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18305-19 SECONDARY DISCHARGE: A NEW JEOPARDY AND A NEW TOOL [131-135]
AUTHOR(S) : LAFFERTY,D.
COMPANY : INTEL

INDEX TERM	CATEGORIES
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18305-18 EMI CHARACTERISTICS OF ESD IN A SMALL AIR GAP --ARP GOVERNS THE EMI-- [124-130]
AUTHOR(S) : HONDA,M. KAWAMURA,T.
COMPANY : NIPPON UNIVAC KAISHA, LTD.

INDEX TERM	CATEGORIES
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18305-17 DESIGNING TO AVOID STATIC - ESD TESTING OF DIGITAL DEVICES [112-123]
AUTHOR(S) : DASH,G.R.
COMPANY : DASH, STRAUS, & GOODHUE, INC.

INDEX TERM	CATEGORIES
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HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]

18305-16 CRITICAL CONSIDERATIONS FOR ESD TESTING [104-111]
AUTHOR(S) : HYATT,H.M.
COMPANY : EXPERIMENTAL PHYSICS CORPORATION

INDEX TERM	CATEGORIES
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TOLERANCES	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
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18305-15 TESTING OF ELECTROSTATIC MATERIALS FED. STD. 101C, METHOD 4046.1 [97-103]
AUTHOR(S) : BAUMGARTNER,G. HAVERMANN,R.
COMPANY : LOCKHEED

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CONDUCTIVE ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
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SURFACE RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
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18305-14 A WRIST STRAP LIFE TEST PROGRAM [94-96]
AUTHOR(S) : HOHL,A.P.
COMPANY : RCA

INDEX TERM	CATEGORIES
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18305-13 A MATERIAL EVALUATION PROGRAM FOR DECORATIVE STATIC CONTROL TABLE TOP LAMINATES [85-93]
AUTHOR(S) : SAFEER,N.I. MILEHAM,J.R.
COMPANY : SPAULDING FIBRE COMPANY, INC.

INDEX TERM	CATEGORIES
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18305-12 AN EXPERIMENTAL STUDY OF THE ESD SCREENING EFFECTIVENESS OF ANTI-STATIC BAGS [78-84]
AUTHOR(S) : HOLMES,G.C. HUFF,P.J. JOHNSON,R.L.
COMPANY : BRITISH TELECOM

INDEX TERM	CATEGORIES
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BULK CONDUCTIVE PLASTIC	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
PROTECTIVE BAGS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
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18305-11 TRIBOELECTRIC CHARGE: ITS ESD ABILITY AND A MEASUREMENT METHOD FOR ITS PROPENSITY ON PACKING MATERIALS [64-77]
AUTHOR(S) : HUNTSMAN,J.R.
COMPANY : 3M

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18305-10 TRIBOELECTRIC TESTING FOR ELECTROSTATIC CHARGES ON MATERIALS AT KENNEDY SPACE CENTER [58-63]
AUTHOR(S) : GOMPF,R.H.
COMPANY : CONSULTANT

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RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
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TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
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MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

18305- 9 ESTIMATION OF DISCHARGE ENERGY RELEASED FROM CHARGED INSULATOR [50-57]
AUTHOR(S) : TABATA,Y.
COMPANY : MINISTORY OF LABOUR

INDEX TERM	CATEGORIES
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18305- 8 STATIC-ELECTRIC CHARACTERIZATION OF SEMI-INSULATING MATERIALS [45-49]
AUTHOR(S) : JONASSEN,N.
COMPANY : TECHNICAL UNIVERSITY OF DENMARK

INDEX TERM	CATEGORIES
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UTHOR(S) : UNGER,B.A. CHEMELLI,R.G. BOSSARD,P.R.
OMPANY : BELL COMMUNICATIONS RESEARCH, INC.

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AUTHOR(S) : CARLTON,R.M.
COMPANY : AMERICAN INSTITUTE OF MEDICAL CLIMATOLOGY (AIMC)

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AUTHOR(S) : BAUMGARTNER,G.
COMPANY : LOCKHEED

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AUTHOR(S) : THOMPSON,W.H.
COMPANY : U.S. AIR FORCE

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AUTHOR(S) : SAUERS,J.P.
COMPANY : MAGNAVOX

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OMPANY : ROCKWELL

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ITHOR(S) : DANGELMAYER,G.T.
OMPANY : ATT

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AUTHOR(S) : BEALL,J. BOWERS,J. ROSSI,M.
COMPANY : MARTIN MARIETTA

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AUTHOR(S) : ENOCH,R.D. SHAW,R.N. TAYLOR,R.G.
COMPANY : BRITISH TELECOM

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AUTHOR(S) : DUVVURY,C. ROUNTREE,R.N. WHITE,L.S.
COMPANY : TEXAS INSTRUMENTS (TI)

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AUTHOR(S) : AVERY,L.R.
COMPANY : RCA

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PANY : IIT RESEARCH INSTITUTE

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MPANY : WESTINGHOUSE

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MPANY : U.S. AIR FORCE

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MPANY : TRW

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THOR(S) : CHASE,E.W.
MPANY : BELL LABORATORIES

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COMPANY : HARRY DIAMOND LAB (HDL)

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AUTHOR(S) : VOLMERANGE,H.
COMPANY : TRW

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AUTHOR(S) : PIERCE,D.G.
COMPANY : BOOZ, ALLEN & HAMILTON

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AUTHOR(S) : DURGIN,D.L. PELZL,R.M. THOMPSON,W.H.
COMPANY : BOOZ, ALLEN & HAMILTON

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AUTHOR(S) : HUNTSMAN,J.R. YENNI,D.M.
COMPANY : 3M

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AUTHOR(S) : SKELTON,D.J. PORTNOY,W.M.
COMPANY : TEXAS TECH UNIVERSITY

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AUTHOR(S) : PIERCE,D.G. MASON,R.M.
COMPANY : BOOZ, ALLEN & HAMILTON

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AUTHOR(S) : YEE,J.H. ORVIS,W.J. MARTIN,L.C.
COMPANY : LAWRENCE LIVERMORE NATIONAL LABORATORY

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AUTHOR(S) : BERBECO,G.R.
COMPANY : CHARLESWATERS PRODUCT, INC.

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COMPANY : NAVAL RESEARCH LABORATORY (NRL)

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AUTHOR(S) : DAVENPORT,D.E.
COMPANY : TRACOR MBA

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18214-24 CIRCUIT DESIGN FOR EOS/ESD PROTECTION [169-174]
AUTHOR(S) : DOMINGOS,H. RAGHAVAN,R.
COMPANY : CLARKSON COLLEGE

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FUTURE TRENDS	[SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	

18214-23 UNIFORM ESD PROTECTION IN A LARGE MULTI-DEPARTMENT ASSEMBLY PLANT [165-168]
AUTHOR(S) : KIRK,W.J.
COMPANY : BENDIX

INDEX TERM	CATEGORIES
COST	[SYSTEMS]
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	

18214-22 ESD MINIMIZATION TECHNIQUE FOR MOS MANUFACTURING FINAL TEST AREA [157-164]
AUTHOR(S) : YOUN,S.Y. HARTDEGEN,N. SHARP,M.
COMPANY : MOSTEK

INDEX TERM	CATEGORIES
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
PROTECTIVE WORK BENCH SURFACE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
CONTAMINATION	[MISC. FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
PROCESS/WORKMANSHIP INDUCED	[MISC. FAILURE PHENOMENA, SEMICONDUCTOR TECH.]

18214-21 AN EFFECTIVE ELECTROSTATIC DISCHARGE PROTECTION PROGRAM [145-156]
AUTHOR(S) : STRAND,C.J. TWEET,A. WEIGHT,M.E.
COMPANY : SPERRY UNIVAC

INDEX TERM	CATEGORIES
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
FLOOR SURFACE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WRIST STRAP	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FUTURE TRENDS	[SEMICONDUCTOR TECH.]
HUMAN FACTORS	[SYSTEMS]
QUALITY ASSURANCE	[SYSTEMS]
SEMICONDUCTOR DEVICE	

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18214-28 ELECTRICAL GROUNDING IN LARGE INSTRUMENTATION SYSTEMS [190-202]
AUTHOR(S) : GRUCHALLA,M.
COMPANY : EG&G WASC, INC.

INDEX TERM	CATEGORIES
CIRCUIT BREAKER	[CIRCUIT PROTECTION DEVICES, NON-ELECTRONICS]
EOS/ESD	[SEMICONDUCTOR TECH.]
GROUNDING METHODS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	
SYSTEM	[LEVEL OF ASSEMBLY]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

18214-27 ELECTROSTATIC DISCHARGE IMMUNITY IN COMPUTER SYSTEMS [185-189]
AUTHOR(S) : SHEEHAN,D.K. BURROUGHS,J.E.
COMPANY : HONEYWELL

INDEX TERM	CATEGORIES
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
FUTURE TRENDS	[SEMICONDUCTOR TECH.]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
COMPUTERIZED TECH	[REL. MODELING TECHNIQUES, REL. MODELS/DATA/ANALYSIS]
COMPUTERIZED	[DATA COLLECTION SYS./TECHNIQUES, REL. MODELS/DATA/ANALYSIS]

18214-26 ELECTROSTATIC DISCHARGE AT THE PRODUCT LEVEL [179-184]
AUTHOR(S) : ELLIS,E.B.
COMPANY : HEWLETT PACKARD

INDEX TERM	CATEGORIES
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
PROCUREMENT CONTROLS	[USER OF REL. PREDICTION MODELS]
SYSTEM	[LEVEL OF ASSEMBLY]
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18214-25 IN-CIRCUIT ANALYSIS OF ESD DAMAGED DEVICES [175-178]
AUTHOR(S) : SAUERS,J.P.
COMPANY : MAGNAVOX

INDEX TERM	CATEGORIES
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
PROCESS CONTROL/SPECIFICATION	[FABRICATION PROCESSES & TECHNIQUES, SEMICONDUCTOR TECH.]
FUTURE TRENDS	[SEMICONDUCTOR TECH.]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

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18172- 4 ANALYSIS OF ELECTROSTATIC CHARGE PROPENSITY OF FLOOR FINISHES [17-20]
AUTHOR(S) : LINDOUSKY,J.E. HOLT,V.E.
COMPANY : BELL LABORATORIES

INDEX TERM	CATEGORIES
MATERIALS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
FLOOR SURFACE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 3 THE PRODUCTION OPERATOR: WEAK LINK OR WARRIOR IN THE ESD BATTLE? [12-16]
AUTHOR(S) : HANSEL,G.E.
COMPANY : MOTOROLA

INDEX TERM	CATEGORIES
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
HUMAN FACTORS	[SYSTEMS]
REFERENCE DOCUMENT	
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 2 ESD CONTROL IMPLEMENTATION AND COST AVOIDANCE ANALYSIS [6-11]
AUTHOR(S) : DOWNING,M.H.
COMPANY : LOCKHEED

INDEX TERM	CATEGORIES
COST	[SYSTEMS]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
TEST EQUIPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 1 ESD-HOW OFTEN DOES IT HAPPEN? [1-5]
AUTHOR(S) : DANGELMAYER,G.T.
COMPANY : WESTERN ELECTRIC COMPANY, INC.

INDEX TERM	CATEGORIES
COMPONENT	[LEVEL OF ASSEMBLY]
DESIGN CONSIDERATIONS	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
REFERENCE DOCUMENT	
TEST TECHNIQUES	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

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18172- 8 A PROGRAMMABLE EQUIPMENT FOR ELECTROSTATIC DISCHARGE TESTING TO HUMAN BODY MODELS [48-55]
AUTHOR(S) : SHAW,R.N. ENOCH,R.D.
COMPANY : BRITISH TELECOM

INDEX TERM	CATEGORIES
GEOMETRIES/LAYOUT	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
COMPUTERIZED ANALYSIS	[DESIGN TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
COMPUTER AIDED DESIGN,(CAD)	[DESIGN TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
SPECIFICATION/STANDARD	[REFERENCE DOCUMENT]
RELIABILITY MODELING TECHNIQUES	[REL. MODELS/DATA/ANALYSIS]
COMPUTERIZED TECH	[REL. MODELING TECHNIQUES, REL. MODELS/DATA/ANALYSIS]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
TEST SPECIFICATION	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 7 CONSTRUCTION AND APPLICATION OF A TESTER FOR MEASURING EOS/ESD THRESHOLDS TO 15KV [37-47]
AUTHOR(S) : LEE,T.W.
COMPANY : MOTOROLA

INDEX TERM	CATEGORIES
DESIGN FOR TESTABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ELECTROSTATIC CHARGE DETECTOR	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
REFERENCE DOCUMENT	
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
TEST TECHNIQUES	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 6 ESD BY STATIC INDUCTION [29-36]
AUTHOR(S) : CHEMELLI,R.G. UNGER,B.A. BOSSARD,P.R.
COMPANY : BELL LABORATORIES

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CHARGE DEVICE MODEL	[ESD, DEVICE, TESTING METHODS]
INDUCTIVE CHARGING	[ESD, EOS/ESD PHYSICS]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
REFERENCE DOCUMENT	
THEORY OF OPERATION	[SEMICONDUCTOR TECH.]

18172- 5 AIR FORCE MAINTENANCE PROGRAM FOR ELECTRICAL OVERSTRESS/ELECTROSTATIC DISCHARGE (EOS/ESD) CONTROL [21-28]
AUTHOR(S) : THOMPSON,W.H. NYBO,C.L. KELAIDIS,M.J.
COMPANY : U.S. AIR FORCE

INDEX TERM	CATEGORIES
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
HUMAN FACTORS	[SYSTEMS]
QUALITY ASSURANCE	[SYSTEMS]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
SPECIFICATION/STANDARD	[REFERENCE DOCUMENT]
MAINTAINABILITY TECHNIQUES	[MAINTAINABILITY, SYSTEMS]

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18172-12 MEASURING EFFECTIVENESS OF AIR IONIZERS [76-86]
AUTHOR(S) : ANTONEVICH,J.N. BLITSHTEYN,M.
COMPANY : SIMCO COMPANY

INDEX TERM	CATEGORIES
CONTROL	[EQUIPMENT TYPE/FUNCTION]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
TOLERANCES	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
AIR IONIZER	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
THEORY OF OPERATION	[SEMICONDUCTOR TECH.]

18172-11 THE ROOM AIR IONIZATION SYSTEM, A BETTER ALTERNATIVE THAN 40% RELATIVE HUMIDITY [67-75]
AUTHOR(S) : MYKKANEN,C.F. BLINDE,D.R.
COMPANY : HONEYWELL

INDEX TERM	CATEGORIES
CONTROL	[EQUIPMENT TYPE/FUNCTION]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
AIR IONIZER	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
EMI - ELECTROMAGNETIC INTERFACE	[ESD, EOS/ESD PHYSICS]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

18172-10 STATIC SURVEY METERS [63-66]
AUTHOR(S) : LONBORG,J.O.
COMPANY : JET PROPULSION LABORATORY (JPL)

INDEX TERM	CATEGORIES
TRADE-OFFS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ELECTROSTATIC CHARGE DETECTOR	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
REFERENCE DOCUMENT	
TEST EQUIPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172- 9 POWER FAILURE MODELING OF INTEGRATED CIRCUITS [56-62]
AUTHOR(S) : ENLOW,E.W. BUDEN,B.N. GIERI,V.A.
COMPANY : BDM CORPORATION

INDEX TERM	CATEGORIES
ELECTRICAL	[TEST STRESS]
EOS/ESD	[SEMICONDUCTOR TECH.]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
COMPUTERIZED TECH	[REL. MODELING TECHNIQUES, REL. MODELS/DATA/ANALYSIS]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

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18172-16 MODELING AND TESTING FOR SECOND BREAKDOWN PHENOMENA [108-117]
AUTHOR(S) : ORVIS,W.J. MARTIN,L.C. YEE,J.H.
COMPANY : LAWRENCE LIVERMORE NATIONAL LABORATORY

INDEX TERM	CATEGORIES
COMPUTER AIDED DESIGN,(CAD)	[DESIGN TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
SECONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE CHARACTERIZATION	[SEMICONDUCTOR TECH.]
TRANSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]

18172-15 CALCULATIONS OF SECOND BREAKDOWN IN SILICON DIODES AT MICROWAVE FREQUENCIES [102-107]
AUTHOR(S) : WARD,A.L.
COMPANY : HARRY DIAMOND LAB (HDL)

INDEX TERM	CATEGORIES
COMPONENT	[LEVEL OF ASSEMBLY]
SECONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
COMPUTERIZED	[DATA COLLECTION SYS./TECHNIQUES, REL. MODELS/DATA/ANALYSIS]
DIODE	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
MICROWAVE	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]

18172-14 COPLANAR TRIBOELECTRIFICATION OF SELECTED MATERIALS [95-101]
AUTHOR(S) : FELT,F.S.
COMPANY : MARTIN MARIETTA

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
REFERENCE DOCUMENT	
THEORY OF OPERATION	[SEMICONDUCTOR TECH.]

18172-13 PERMANENCE OF THE ANTISTATIC PROPERTY OF COMMERCIAL ANTISTATIC BAGS AND TOTE BOXES [87-94]
AUTHOR(S) : KOLYER,J.M. ANDERSON,W.E.
COMPANY : ROCKWELL

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
CONTROL	[EQUIPMENT TYPE/FUNCTION]
MATERIALS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
TRADE-OFFS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ANTISTATIC IMPREGNATED PLASTIC	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
PROTECTIVE BAGS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
SURFACE RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
FABRICATION PROCESSES & TECHNIQUES	[SEMICONDUCTOR TECH.]
PKG BODY MATERIAL	[PACKAGE, SEMICONDUCTOR TECH.]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
TEST EQUIPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]
TEST TECHNIQUES	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

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18172-20 ESD EVALUATION OF RADIATION-HARDENED, HIGH RELIABILITY CMOS AND MNOS ICS [134-146]
AUTHOR(S) : SODEN,J.M. STEWART,H.D. PASTOREK,R.A.
COMPANY : SANDIA LABORATORIES

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
EVALUATION TEST	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]
TEST TECHNIQUES	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172-19 ESD SENSITIVITY OF COMPLEX ICS [128-133]
AUTHOR(S) : WILSON,D.
COMPANY : MARTIN MARIETTA

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CHARGE DEVICE MODEL	[ESD, DEVICE, TESTING METHODS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
TEST SPECIFICATION	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

18172-18 SEMICONDUCTOR JUNCTION NON-LINEAR FAILURE POWER THRESHOLDS: WUNSCH-BELL REVISITED [122-127]
AUTHOR(S) : ASH,M.S.
COMPANY : TRW

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
MATHEMATICAL ANALYSIS	
SEMICONDUCTOR DEVICE	
STATISTICAL ANALYSIS	

18172-17 TEMPERATURE AT SECOND BREAKDOWN AT A WELL-DEFINED SITE [118-121]
AUTHOR(S) : STOTTS,L.J. PORTNOY,W.M.
COMPANY : TEXAS TECH UNIVERSITY

INDEX TERM	CATEGORIES
SECONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
THERMAL SECONDARY BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
MATHEMATICAL ANALYSIS	
THERMAL STRESS/STRAIN	[MECHANICAL & PHYSICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
DIODE	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
THERMAL	[TEST STRESS]

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18172-24 METAL OXIDE VARISTORS FOR TRANSIENT PROTECTION OF 3 TO 5-VOLT INTEGRATED CIRCUITS [168-176]
AUTHOR(S) : MAY,J.E. KORN,S.R.
COMPANY : GENERAL ELECTRIC

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
ELECTRICAL	[TEST STRESS]
EOS/ESD	[SEMICONDUCTOR TECH.]
TRANSIENT SUPPRESSORS	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

18172-23 INVISIBLE EOS/ESD DAMAGE: HOW TO FIND IT [158-167]
AUTHOR(S) : BRENNAN,T.F.
COMPANY : SPERRY CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE INDICATOR	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	

18172-22 EOS OR ESD: CAN FAILURE ANALYSIS TELL THE DIFFERENCE? [154-157]
AUTHOR(S) : NOEL,P.H. DREIBELBIS,D.H.
COMPANY : IBM CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE INDICATOR	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	

18172-21 THE EFFECT OF ESD ON CCD RELIABILITY [147-153]
AUTHOR(S) : WHITEHEAD,A.P. LYNCH,J.T.
COMPANY : PLESSEY

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CHARGE DEVICE MODEL	[ESD, DEVICE, TESTING METHODS]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
CCD	[FIELD EFFECT,(FET), SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
LIFE	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]
OPERATIONAL TEST	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]

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17517-35 NON-LINEAR KINETICS OF SEMICONDUCTOR JUNCTION THERMAL FAILURE [242-245]
AUTHOR(S) : ASH,M.S.
COMPANY : TRW

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
MATHEMATICAL ANALYSIS	
DISCRETE SEMICONDUCTOR	[SEMICONDUCTOR DEVICE]

17517-34 EVALUATION OF ELECTROSTATIC DISCHARGE TO 16K EPROMS [236-241]
AUTHOR(S) : CHASE,E.W.
COMPANY : BELL LABORATORIES

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CHARGE DEVICE MODEL	[ESD, DEVICE, TESTING METHODS]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
DIGITAL LSI	[MICROCIRCUIT, SEMICONDUCTOR DEVICE]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

17517-33 EOS DAMAGE IN SILICON SOLAR CELLS [209-235]
AUTHOR(S) : PEASE,R.L. BARNUM,J. VULIET,W.
COMPANY : MISSION RESEARCH CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
MATHEMATICAL ANALYSIS	
RELIABILITY MODELING TECHNIQUES	[REL. MODELS/DATA/ANALYSIS]
DETECTOR/SENSOR	[OPTOELECTRONIC, SEMICONDUCTOR DEVICE]

17517-32 TIME-RELATED IMPROVEMENTS OF ELECTRICAL CHARACTERISTICS IN ELECTROSTATICALLY DAMAGED OPERATIONAL AMPLIFIERS [225-228]
AUTHOR(S) : HEAD,G.O.
COMPANY : LEAR SIEGLER, INC.

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]

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17517-31 FAILURE ANALYSIS OF SEMICONDUCTOR DEVICES IN EOS/ESD TESTING [219-224]
AUTHOR(S) : LIN,T.S. HORGAN,E.L.
COMPANY : TRW

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
THERMAL SECONDARY BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
DISCRETE SEMICONDUCTOR	[SEMICONDUCTOR DEVICE]
STATISTICAL ANALYSIS	
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

17517-30 LIGHTNING PROTECTION FOR COMPUTER DATA LINES [212-218]
AUTHOR(S) : CLARK,O.M.
COMPANY : GENERAL SEMICONDUCTOR INDUSTRIES

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
COMPUTATION	[EQUIPMENT TYPE/FUNCTION]
EOS/ESD	[SEMICONDUCTOR TECH.]
TRANSIENT SUPPRESSORS	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
REFERENCE DOCUMENT	

17517-29 POTENTIAL ESD HAZARDS ASSOCIATED WITH EXPLOSIVE PRIMERS [208-211]
AUTHOR(S) : MYKKANEN,C.F.
COMPANY : HONEYWELL

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
FAILURE CAUSE	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
WEAPONS	[EQUIPMENT TYPE/FUNCTION]

17517-28 EOS THRESHOLD DETERMINATION OF ELECTRO-EXPLOSIVE DEVICES [202-207]
AUTHOR(S) : HAYS,R.A.
COMPANY : U.S. AIR FORCE

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
DIELECTRIC BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
FAILURE CHARACTERIZATION	[SEMICONDUCTOR TECH.]
MISSILE	[APPLICATION ENVIRONMENT]

17517-27 BEHAVIOR OF THICK-FILM POWER RESISTORS SUBJECTED TO LARGE MOMENTARY OVERLOADS [198-201]
AUTHOR(S) : MATHURIN,J. THOMAS,R.M. GUAY,R.H.
COMPANY : EPITEK ELECTRONIC, LTD.

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
RESISTOR	[PASSIVE DEVICE, COMPONENT TYPE]
REFERENCE DOCUMENT	

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17517-26 PREDICTION OF THIN-FILM RESISTOR BURNOUT [192-197]
AUTHOR(S) : SMITH,J.S. LITTAU,W.R.
COMPANY : LOCKHEED

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
MATHEMATICAL ANALYSIS	
RESISTOR	[PASSIVE DEVICE, COMPONENT TYPE]
REFERENCE DOCUMENT	

17517-25 PULSE POWER RESPONSE AND DAMAGE CHARACTERISTICS OF CAPACITORS [174-191]
AUTHOR(S) : TASCA,D.M.
COMPANY : GENERAL ELECTRIC

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
DIELECTRIC BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
CAPACITOR	[PASSIVE DEVICE, COMPONENT TYPE]
REFERENCE DOCUMENT	

17517-24 AN OVERVIEW OF EOS EFFECTS ON PASSIVE COMPONENTS [167-173]
AUTHOR(S) : WUNSCH,D.C.
COMPANY : BDM CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE CHARACTERIZATION	[SEMICONDUCTOR TECH.]
RESISTOR	[PASSIVE DEVICE, COMPONENT TYPE]
RELIABILITY	[SYSTEMS]
REFERENCE DOCUMENT	

17517-23 EOS/ESD FAILURE THRESHOLD ANALYSIS ERRORS, THEIR SOURCE, SIZE AND CONTROL [151-166]
AUTHOR(S) : HORGAN,E.L. TEMPLAR,L.C. ROWAN,W.H.
COMPANY : TRW

INDEX TERM	CATEGORIES
SECONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
RELIABILITY MODELING TECHNIQUES	[REL. MODELS/DATA/ANALYSIS]
DISCRETE SEMICONDUCTOR	[SEMICONDUCTOR DEVICE]

17517-22 DETERMINING AN EMITTER-BASE FAILURE THRESHOLD DISTRIBUTION OF NPN TRANSISTORS [145-150]
AUTHOR(S) : ENLOW,E.W.
COMPANY : BDM CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
FAILURE ANALYSIS TECHNIQUES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
TRANSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
WEIBULL	[STATISTICAL ANALYSIS]

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17517-21 SEMICONDUCTOR DEVICE FAILURE CRITERIA FOR SINUSOIDAL STRESSES [139-144]
AUTHOR(S) : THOMAS,R.E.
COMPANY : KAMAN SCIENCES CORPORATION

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE CHARACTERIZATION	[SEMICONDUCTOR TECH.]
MATHEMATICAL ANALYSIS	
DISCRETE SEMICONDUCTOR	[SEMICONDUCTOR DEVICE]

17517-20 MODELING OF EOS IN SILICON DEVICES [132-138]
AUTHOR(S) : KUSNEZOV,N. SMITH,J.S.
COMPANY : LOCKHEED

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
RELIABILITY MODELING TECHNIQUES	[REL. MODELS/DATA/ANALYSIS]
COMPUTERIZED	[DATA COLLECTION SYS./TECHNIQUES, REL. MODELS/DATA/ANALYSIS]
SILICON	[SEMICONDUCTOR TECH.]

17517-19 AN OVERVIEW OF EOS EFFECTS ON SEMICONDUCTOR DEVICES [120-131]
AUTHOR(S) : PIERCE,D.G. DURGIN,D.L.
COMPANY : BOOZ, ALLEN & HAMILTON

INDEX TERM	CATEGORIES
OXIDATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
EOS - ELECTRICAL OVERSTRESS	[ESD, EOS/ESD PHYSICS]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE MODES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
DISCRETE SEMICONDUCTOR	[SEMICONDUCTOR DEVICE]

17517-18 ELECTRICAL OVERSTRESS INVESTIGATIONS IN MODERN INTEGRATED CIRCUIT TECHNOLOGIES [114-119]
AUTHOR(S) : KARASKIEWICZ,R.J. YOUNG,P.A. ALEXANDER,D.R.
COMPANY : BDM CORPORATION

INDEX TERM	CATEGORIES
RELIABILITY	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
WUNSCH BELL MODEL	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FUTURE TRENDS	[SEMICONDUCTOR TECH.]
DIGITAL LSI	[MICROCIRCUIT, SEMICONDUCTOR DEVICE]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]
STEP STRESS	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]

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17517-17 SUSCEPTIBILITY OF ICS IN ESD STEP-STRESS TESTS [106-113]
AUTHOR(S) : ENDERS,J.
COMPANY : STANDARD ELECTRIK LORENZ AG

INDEX TERM	CATEGORIES
PROCESS DESIGN	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]
STEP STRESS	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]

17517-16 DIAGNOSIS AND ANALYSIS OF EMITTER-BASE JUNCTION OVERSTRESS DAMAGE [101-105]
AUTHOR(S) : JENSEN,M.C. MILBURN,R.T.
COMPANY : MOTOROLA

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE CAUSE	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
TRANSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
TEST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

17517-15 INPUT PROTECTION DESIGN FOR THE 3-MICRON NMOS PROCESS [97-100]
AUTHOR(S) : TAYLOR,R.G.
COMPANY : MOSTEK

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
SEMICONDUCTOR DEVICE	
TEST SPECIFICATION	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

17517-14 ON CHIP PROTECTION OF HIGH DENSITY NMOS DEVICES [90-96]
AUTHOR(S) : HULETT,T.V.
COMPANY : MOTOROLA

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
OXIDATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
SEMICONDUCTOR DEVICE	
TEST TECHNIQUES	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

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17517-13 THE EFFECTS OF VLSI SCALING ON EOS/ESD FAILURE THRESHOLD [85-89]
AUTHOR(S) : PANCHOLY,R.K.
COMPANY : ROCKWELL

INDEX TERM	CATEGORIES
CIRCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
EOS/ESD	[SEMICONDUCTOR TECH.]
DIELECTRIC BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FABRICATION PROCESSES & TECHNIQUES	[SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	

17517-12 SELECTION OF PACKAGING MATERIALS FOR ESD SENSITIVE ITEMS [75-84]
AUTHOR(S) : KOLYER,J.M. ANDERSON,W.E.
COMPANY : ROCKWELL

INDEX TERM	CATEGORIES
MATERIALS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ELECTROSTATIC SHIELD	[ESD, EOS/ESD PHYSICS]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
PROTECTIVE BAGS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
TOPICAL ANTISTATS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
PACKAGE	[SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
EVALUATION TEST	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]

17517-11 INCOMING INSPECTION OF ANTISTATIC PACKAGING MATERIALS [65-74]
AUTHOR(S) : TOPOLSKI,A.S.
COMPANY : DU PONT

INDEX TERM	CATEGORIES
MATERIALS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ELECTROSTATIC CHARGE DETECTOR	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
SURFACE RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
VOLUME RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
PACKAGE	[SEMICONDUCTOR TECH.]
QUALITY ASSURANCE	[SYSTEMS]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
EVALUATION TEST	[TEST TECHNIQUES FOR REL. ASSESSMENT, SEMICONDUCTOR TECH.]

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17517-10 EVALUATION OF INTEGRATED CIRCUIT SHIPPING TUBES [57-64]
AUTHOR(S) : UNGER,B. CHEMELLI,R.G. BOSSARD,P.R.
COMPANY : BELL LABORATORIES

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
CHARGE DEVICE MODEL	[ESD, DEVICE, TESTING METHODS]
DIP TUBE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
PACKAGE	[SEMICONDUCTOR TECH.]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]
SEMICONDUCTOR DEVICE	

17517- 9 CHO-TRAP, A NOVEL VOLTAGE TRANSIENT PROTECTION PACKAGING MATERIAL [49-56]
AUTHOR(S) : PEDULLA,J. MALINARIB,P.
COMPANY : CHOMERIC, INC.

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
HUMAN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
REFERENCE DOCUMENT	

17517- 8 AN ANALYSIS OF ANTISTATIC CUSHIONING MATERIALS [44-48]
AUTHOR(S) : TENZER,F.D. HARTMANN,H.C. JOHNSON,M.A.
COMPANY : PACKAGING INDUSTRIES OF CALIFORNIA

INDEX TERM	CATEGORIES
MATERIALS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
SURFACE RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
TOPICAL ANTISTATS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
TRIOBOELECTRIC CHARGING	[ESD, EOS/ESD PHYSICS]
REFERENCE DOCUMENT	
TEST PROGRAM DEVELOPMENT	[TESTING TOOLS & TECHNIQUES, SEMICONDUCTOR TECH.]

17517- 7 A LOW-COST PROGRAM FOR EVALUATION OF ESD PROTECTIVE MATERIALS AND EQUIPMENT [41-43]
AUTHOR(S) : HEAD,G.O.
COMPANY : LEAR SIEGLER, INC.

INDEX TERM	CATEGORIES
COST	[SYSTEMS]
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
AIR IONIZER	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
CONDUCTIVE ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
SURFACE RESISTIVITY	[ESD, MATERIALS AND EQUIPMENT, TESTING]
GUIDE/PROCEDURE	[REFERENCE DOCUMENT]

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17517- 6 A PRAGMATIC APPROACH TO ESD PROBLEM SOLVING IN THE MANUFACTURING ENVIRONMENT A CASE HISTORY [34-39]
AUTHOR(S) : MCALEER,R.E. LUCAS,G.H. MCDONALD,A.
COMPANY : TEXAS INSTRUMENTS (TI)

INDEX TERM	CATEGORIES
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
GROUNDING STRAPS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
PROTECTIVE WORK BENCH SURFACE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
REFERENCE DOCUMENT	

17517- 5 THE ECONOMIC BENEFITS OF AN EFFECTIVE ESD AWARENESS AND CONTROL PROGRAM - AN EMPIRICAL ANALYSIS [29-33]
AUTHOR(S) : MCFARLAND,W.Y.
COMPANY : WESTERN ELECTRIC COMPANY, INC.

INDEX TERM	CATEGORIES
COMPONENT	[LEVEL OF ASSEMBLY]
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
AIR IONIZER	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
GROUNDING STRAPS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
SENSITIVE ELECTRONIC DEVICE SYMBOLS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	

17517- 4 THE PERFECT "10" - CAN YOU REALLY HAVE ONE? [21-27]
OTHOR(S) : FRANK,D.E.
COMPANY : DOUGLAS AIRCRAFT

INDEX TERM	CATEGORIES
COMPONENT	[LEVEL OF ASSEMBLY]
APPLICATION FACTORS	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
DEVELOPMENT PROGRAM	[SEMICONDUCTOR TECH.]
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
PROTECTED ESD AREA	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
WORKMANSHIP	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
QUALITY ASSURANCE	[SYSTEMS]
REFERENCE DOCUMENT	
SEMICONDUCTOR DEVICE	

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17517- 3 ANALYSIS OF ESD FAILURES [14-20]
AUTHOR(S) : MCATEER,O.J. TWIST,R.E.
COMPANY : WESTINGHOUSE

INDEX TERM	CATEGORIES
EOS/ESD	[SEMICONDUCTOR TECH.]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OVERSTRESS	[FAILURE CAUSE, FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
FAILURE ANALYSIS RESULTS	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
REFERENCE DOCUMENT	
MICROCIRCUIT	[SEMICONDUCTOR DEVICE]

17517- 2 QUANTITATIVE EFFECTS OF RELATIVE & ABSOLUTE HUMIDITY ON ESD GENERATION/ SUPPRESSION [9-13]
AUTHOR(S) : BLINDE,D.R. LAVOIE,L.
COMPANY : HONEYWELL

INDEX TERM	CATEGORIES
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AIR IONIZER	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
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AUTHOR(S) : HYATT,H.M. CALVIN,H. MELLBERG,H.
COMPANY : EXPERIMENTAL PHYSICS CORPORATION

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AUTHOR(S) : CALVIN,H. HYATT,H. MELLBERG,H.
COMPANY : EXPERIMENTAL PHYSICS CORPORATION

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17516-32 AN EVALUATION OF WRIST STRAP PARAMETERS [218-224]
AUTHOR(S) : SOHL,J.E.
COMPANY : HONEYWELL

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AUTHOR(S) : BOLASNY,R.E.
COMPANY : SCIENTIFIC ENTERPRISES, INC.

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EMI - ELECTROMAGNETIC INTERFACE	[ESD, EOS/ESD PHYSICS]
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AUTHOR(S) : DOMINGOS,H.
COMPANY : CLARKSON COLLEGE

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AUTHOR(S) : HALPERIN,S.A.
COMPANY : ANALYTICAL CHEMICAL LABORATORY

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ESD PROTECTIVE MATERIAL	[ESD, MATERIALS AND EQUIPMENT, TESTING]
EMI - ELECTROMAGNETIC INTERFACE	[ESD, EOS/ESD PHYSICS]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
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UTHOR(S) : MCATEER,O.J.
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AUTHOR(S) : ANTINONE,R.J.
COMPANY : BDM CORPORATION

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AUTHOR(S) : KRESSLER,D.R.
COMPANY : BELL LABORATORIES

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AUTHOR(S) : CROUCH,K.E.
COMPANY : LIGHTNING TECHNOLOGIES

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AUTHOR(S) : HESS,R.F.
COMPANY : SPERRY CORPORATION

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TRANSIENT SUPPRESSORS	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
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UTHOR(S) : DURGIN,D.L.
OMPANY : BOOZ, ALLEN & HAMILTON

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UTHOR(S) : SMYTH,J.B. VAN LINT,V.A.J.
OMPANY : MISSION RESEARCH CORPORATION

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UTHOR(S) : HORGAN,E.L.
OMPANY : TRW

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MP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
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7516-20 *OSCILLATING VOLTAGE PULSES AND SECOND BREAKDOWN* [130-139]
UTHOR(S) : WARD,A.L.
OMPANY : HARRY DIAMOND LAB (HDL)

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ECONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
OS/ESD	[SEMICONDUCTOR TECH.]
ECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
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HOR(S) : KNIGHT,E.R. BUDENSTEIN,P.P.
PANY : AUBURN UNIVERSITY

EX TERM	CATEGORIES
ONDARY BREAKDOWN	[ELECTRICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
/ESD	[SEMICONDUCTOR TECH.]
SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
RMAL SECONDARY BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
DE	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]

16-18 SOME DESIGN CRITERIA FOR AVOIDING SECOND BREAKDOWN IN BIPOLAR DEVICES [117-121]
HOR(S) : MATHEWS,D.
PANY : U.S. ARMY

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GLAR	[COMPONENT TYPE]
/ESD	[SEMICONDUCTOR TECH.]
SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
RMAL SECONDARY BREAKDOWN	[ESD, DEVICE, FAILURE MODES]
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HOR(S) : HOWER,P.L.
PANY : WESTINGHOUSE

EX TERM	CATEGORIES
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S/ESD	[SEMICONDUCTOR TECH.]
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16-16 SUPRISING PATTERNS OF CMOS SUSCEPTIBILITY TO ESD AND IMPLICATIONS ON LONG-TERM RELIABILITY [104-111]
HOR(S) : SCHWANK,J.R. BAKER,R.P. ARMENDARIZ,M.G.
PANY : SANDIA LABORATORIES

EX TERM	CATEGORIES
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S/ESD	[SEMICONDUCTOR TECH.]
D SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
OS	[FIELD EFFECT,(FET), SEMICONDUCTOR TECH.]
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ST TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

16-15 ELECTROSTATIC SENSITIVITY OF VARIOUS INPUT PROTECTION NETWORKS [95-103]
HOR(S) : TURNER,T.E. MORRIS,S.
PANY : MOSTEK

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RCUIT PROTECTION DEVICES	[NON-ELECTRONICS]
IDATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
OMETRIES/LAYOUT	[DESIGN CONSIDERATIONS, SEMICONDUCTOR TECH.]
S/ESD	[SEMICONDUCTOR TECH.]
PUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
D SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]

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16-14 LSI DESIGN CONSIDERATIONS FOR ESD PROTECTION STRUCTURES RELATED TO PROCESS AND LAYOUT VARIATIONS [87-94]
HOR(S) : HART,A.R. TENG,T.
PANY : HEWLETT PACKARD

EX TERM	CATEGORIES
DATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
IGN CONSIDERATIONS	[SEMICONDUCTOR TECH.]
/ESD	[SEMICONDUCTOR TECH.]
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HOR(S) : LUISI,J.A.
PANY : ROCKWELL

EX TERM	CATEGORIES
CUIT PROTECTION DEVICES	[NON-ELECTRONICS]
IGN CONSIDERATIONS	[SEMICONDUCTOR TECH.]
/ESD	[SEMICONDUCTOR TECH.]
UT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
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16-12 PROTECTION OF MOS INTEGRATED CIRCUITS FROM DESTRUCTION BY ELECTROSTATIC DISCHARGE [73-80]
HOR(S) : KELLER,J.K.
PANY : BELL LABORATORIES

EX TERM	CATEGORIES
CUIT PROTECTION DEVICES	[NON-ELECTRONICS]
DATION	[CHEMICAL FAILURE PHENOMENA, SEMICONDUCTOR TECH.]
/ESD	[SEMICONDUCTOR TECH.]
AN BODY ESD MODEL	[ESD, DEVICE, TESTING METHODS]
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16-11 ANALYSIS OF ESD DAMAGE IN JFET PREAMPLIFIERS [67-72]
HOR(S) : CASTLE,G.S.P. HIBBERT,D.R.
PANY : NORTHERN TELECOM

EX TERM	CATEGORIES
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16-10 FAILURE THRESHOLD DISTRIBUTIONS IN BIPOLAR TRANSISTORS [59-66]
HOR(S) : ENLOW,E.W. KARASKIEWICZ,R.J.
PANY : SANDIA LABORATORIES

EX TERM	CATEGORIES
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CTRICAL FAILURE PHENOMENA	[SEMICONDUCTOR TECH.]
/ESD	[SEMICONDUCTOR TECH.]
SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
NSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]
T TECHNIQUES FOR REL. ASSESSMENT	[SEMICONDUCTOR TECH.]

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AUTHOR(S) : ZAJAC,H.
COMPANY : TEKTRONIX

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INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
METALLIZATION MELT	[ESD, DEVICE, FAILURE MODES]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
TRANSISTOR	[DISCRETE SEMICONDUCTOR, SEMICONDUCTOR DEVICE]

17516- 8 IDENTIFICATION OF LATENT ESD FAILURES [54-57]
AUTHOR(S) : WALKER,R.C.
COMPANY : IIT RESEARCH INSTITUTE

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FAILURE MODES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
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AUTHOR(S) : BAZARIAN,A.
COMPANY : GENERAL INSTRUMENT

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INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
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17516- 6 PROTECTION LEVEL COMPARISONS FOR VOLTAGE TRANSIENT SUPPRESSORS (120 V, AC TYPE) [35-43]
AUTHOR(S) : HOPKINS,D.C.
COMPANY : GENERAL ELECTRIC

INDEX TERM	CATEGORIES
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INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
EMI - ELECTROMAGNETIC INTERFACE	[ESD, EOS/ESD PHYSICS]
TRANSIENT SUPPRESSORS	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
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AUTHOR(S) : PHILIPP,H.R. LEVINSON,L.M.
COMPANY : GENERAL ELECTRIC

INDEX TERM	CATEGORIES
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INPUT PROTECTION	[ESD, DEVICE, PROTECTIVE DEVICES/INPUT PROTECTION]
STATIC CONTROL	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
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AUTHOR(S) : WU,C. PARADISE,E.D.
COMPANY : IBM CORPORATION

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TESTING TOOLS & TECHNIQUES	[SEMICONDUCTOR TECH.]

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AUTHOR(S) : BOSSARD,P.R. CHEMELLI,R.G. UNGER,B.A.
COMPANY : BELL LABORATORIES

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ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
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FAILURE MODES	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
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TESTING TOOLS & TECHNIQUES	[SEMICONDUCTOR TECH.]

17516- 2 *THE EFFECTS OF HIGH HUMIDITY ENVIRONMENTS ON ELECTROSTATIC GENERATION AND* DISCHARGE [12-16]
AUTHOR(S) : CAIDERBANK,J.M. OVERBAY,D.E. SNYOER,H.Z.
COMPANY : E-SYSTEMS, INC.

INDEX TERM	CATEGORIES
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DECAY TIME	[ESD, MATERIALS AND EQUIPMENT, TESTING]
ESD CONTROL PROGRAM	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
RELATIVE HUMIDITY	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
FLOOR SURFACE	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE]
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AUTHOR(S) : BERBECO,G.R.
COMPANY : CHARLESWATERS PRODUCT, INC.

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GROUNDING METHODS	[ESD, MATERIALS AND EQUIPMENT, PROTECTIVE TECHNIQUES]
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ESD STD AND HANDBOOK	[ESD, STANDARDS, HANDBOOKS, MANUALS]
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AUTHOR(S) : MADISON,J.A.
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AUTHOR(S) : CABAYAN,H.S. DEADRICK,F.J. MARTIN,L.C.
COMPANY : LAWRENCE LIVERMORE NATIONAL LABORATORY

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EOS/ESD	[SEMICONDUCTOR TECH.]
EMP - ELECTROMAGNETIC PULSE	[ESD, EOS/ESD PHYSICS]
ESD SUSCEPTIBILITY TESTING	[ESD, DEVICE, TESTING METHODS]
FAILURE CAUSE	[FAILURE ANALYSIS, SEMICONDUCTOR TECH.]
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17515-28 ELECTROSTATIC DISCHARGE PROTECTION USING SILICON TRANSIENT SUPPRESSORS [193-197]
AUTHOR(S) : CLARK,O.M.
COMPANY : GENERAL SEMICONDUCTOR INDUSTRIES

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17515-27 THE PHANTOM EMITTER-AN ESD-RESISTANT BIPOLAR TRANSISTOR DESIGN AND ITS APPLICATIONS TO LINEAR INTEGRATED CIRCUITS [188-192]
AUTHOR(S) : MINEAR,R.L. DODSON,G.A.
COMPANY : BELL LABORATORIES

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AUTHOR(S) : PETRIZIO,C.J.
COMPANY : RCA

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AUTHOR(S) : SODEN,J.M.
COMPANY : SANDIA LABORATORIES

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AUTHOR(S) : TENG,T. HART,A.R. MCKENNA,A.
COMPANY : HEWLETT PACKARD

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AUTHOR(S) : FORMANEK,V.C.
COMPANY : IIT RESEARCH INSTITUTE

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AUTHOR(S) : WHALEN,J.J. THORN,M.L. RASTEFANO,E.
COMPANY : SUNY AT BUFFALO

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AUTHOR(S) : WHALEN,J.J. DOMINGOS,H.
COMPANY : SUNY AT BUFFALO

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AUTHOR(S) : KUSENEZOV,N. SMITH,J.S.
COMPANY : LOCKHEED

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AUTHOR(S) : BARUAH,A. BUDENSTEIN,P.P.
COMPANY : AUBURN UNIVERSITY

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AUTHOR(S) : SCHNETKER,T.R.
COMPANY : GOULD

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AUTHOR(S) : BLACKBURN,D.L. BERNING,D.W.
COMPANY : NATIONAL BUREAU OF STANDARDS (NBS)

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AUTHOR(S) : WARD,A.L.
COMPANY : HARRY DIAMOND LAB (HDL)

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AUTHOR(S) : MOON,M.G.
COMPANY : HARRIS

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AUTHOR(S) : ANAND,Y.
COMPANY : MICROWAVE ASSOCIATES, INC.

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AUTHOR(S) : UETSUKI,T. MITANI,S.
COMPANY : HITACHI

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AUTHOR(S) : KING,M.W.
COMPANY : CONSULTANT

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AUTHOR(S) : RUTHERFORD,D.H. PERKINS,J.F.
COMPANY : RAYTHEON

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AUTHOR(S) : BRANBERG,G.
COMPANY : HEWLETT PACKARD

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AUTHOR(S) : YENNI,D.M. HUNTSMAN,J.R.
COMPANY : 3M

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AUTHOR(S) : MC CULLOUGH,D.T. LANE,C.H. BLORE,R.A.
COMPANY : ROME AIR DEVELOPMENT CENTER (RADC)

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AUTHOR(S) : MADZY,T.M. PRICE,L.A.
COMPANY : IBM CORPORATION

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AUTHOR(S) : MC MAHON,E.J. BHAR,T.N. OISHI,T.
COMPANY : RELIABILITY SCIENCES, INC.

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AUTHOR(S) : DERMARDEROSIAN,A. RIDEOUT,L.
COMPANY : RAYTHEON

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AUTHOR(S) : HALPERIN,S.A.
COMPANY : ANALYTICAL CHEMICAL LABORATORY

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AUTHOR(S) : BRIGGS,C.
COMPANY : CHARLES STARK DRAPER LABORATORIES

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AUTHOR(S) : STORM,D.C.
COMPANY : AEROSPACE CORPORATION

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AUTHOR(S) : MCATEER,O.J.
COMPANY : WESTINGHOUSE

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