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AUTOMATIC MICROWAVE SEMICONDUCTOR DEVICE TESTING(U)
HARRIS CORP SYOSSET NY GOVERNMENT SUPPORT SYSTEMS DIV
C LOK 25 OCT 85 DARB07-85-C-K366

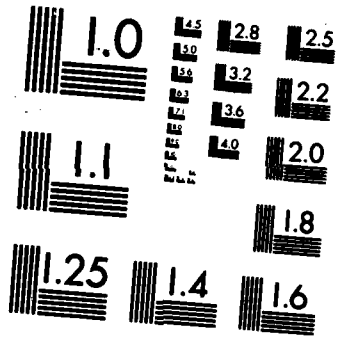
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b. RESTRICTIVE MARKINGS (3)	
2a. SECURITY CLASSIFICATION AUTHORITY DECLASSIFICATION/DOWNGRADING SCHEDULE		3. DISTRIBUTION/AVAILABILITY OF REPORT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED	
PERFORMING ORGANIZATION REPORT NUMBER(S)		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
NAME OF PERFORMING ORGANIZATION HARRIS CORPORATION GSSD DIVISION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION U.S. ARMY COMMUNICATIONS-ELECTRONICS INDUSTRIAL PREPAREDNESS BRANCH	
ADDRESS (City, State and ZIP Code) 6801 JERICHO TURNPIKE SYOSSET, NEW YORK 11791		7b. ADDRESS (City, State and ZIP Code) FT. MONMOUTH, N.J. 07703-5008 ATT: AMSEL-PC-SI-I-2 (J.KELLY)	
NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	8. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DAAB07-85-C-K566	
ADDRESS (City, State and ZIP Code)		10. SOURCE OF FUNDING NOS.	
		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT NO.
11. TITLE (Include Security Classification) AUTOMATIC MICRO-WAVE SEMICONDUCTOR DEVICE TESTING (U)			
12. PERSONAL AUTHOR(S) LOK, CHI-BONG			
13a. TYPE OF REPORT QUARTERLY	13b. TIME COVERED FROM 85/7/16 TO 85/10/	14. DATE OF REPORT (Yr., Mo., Day) 5 1985 October 25	15. PAGE COUNT 4
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SEMICONDUCTORS, MANUFACTURING METHODS AND TECHNOLOGY	
	SUB. GR.		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)			
During the past three months, the project team has focused on ; (1) analyses of type I, II, and III device characteristics; (2) definition of device measurement parameters using minimum number of test fixtures; (3) selection of the system computer and operating system.			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS <input type="checkbox"/>		21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL		22b. TELEPHONE NUMBER (Include Area Code)	22c. OFFICE SYMBOL

AD-A173 423

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"AUTOMATIC MICROWAVE SEMICONDUCTOR
DEVICE TESTING"

FIRST QUARTERLY PROGRESS REPORT
(JULY 16, 1985 to OCTOBER 15, 1985)

This project has been accomplished as part of the US Army Manufacturing Methods and Technology (MM&T) Program, which has as its objective the timely establishment of manufacturing processes, techniques or equipment to insure the efficient production of current or future defense programs.

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Unannounced	<input type="checkbox"/>
Justification	
<i>Per John Cook</i>	
By	<i>TS</i>
Distribution/	
Availability Codes	
Dist	Avail and/or Special
<i>A1</i>	



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86 10 24 029

1st Quarter Report

(July 16 - October 15)

During the past three months, the project team has focused on; (1) analyses of type I, II, and III device characteristics; (2) definition of device measurement parameters using minimum number of test fixtures; (3) selection of the system computer and operating systems.

The preliminary selection of type I, II and III devices was presented at the meeting on September 26, 1985. As directed by Mr. J. Kelly at the same meeting, high power devices would be added to the list and the test fixtures would be selected for universal purpose. Maury Microwave Corporation is considered as the prime supplier of the test fixtures. Due to different device package types such as IMPATT diodes, other test fixtures would be needed.

The preliminary device measurement parameters are defined as follows:

(1) GaAs Varactor:

- (a) R_s vs bias
- (b) Q vs bias
- (c) C vs bias
- (d) $\left(\frac{f_{\max}}{f_{\min}}\right)^2 = \left(\frac{C_{\min}}{C_{\max}}\right)$
- (e) $(f_1 * Q_1) = (f_2 * Q_2)$

(2) IMPATT Diode:

- (a) Efficiency vs bias
- (b) RF power vs bias
- (c) Impedance = (+ Real + Imaginary Components)
- (d) Impedance vs driven signal

(3) GaAs FET/Si Bipolar Transistor:

- (a) S-Parameters vs frequency
- S-Parameters vs bias
- S-Parameters vs driver signal
- S-Parameters vs gain
- S-Parameters vs stability
- S-Parameters vs input VSWR
- S-Parameters vs output VSWR

(4) GaAs/Si Beam Lead Mixer Diode:

- (a) Capacitance
- (b) Break-down voltage
- (c) R_s vs bias current
- (d) Noise figure vs driver signal

(5) GaAs/Si Beam Lead Pin Diode:

- (a) Capacitance
- (b) Break-down voltage
- (c) R_s vs bias current
- (d) R_s vs $\frac{1}{2}$ break-down voltage

(6) Phase Shifter Diode:

- (a) Capacitance
- (b) Insertion Loss
- (c) Phase-shift (insertion phase)

(7) Amplifier Diode

- (a) Output power vs driver signal
- (b) Gain vs driver signal

(8) Mixer Quad Diode:

- (a) Noise figure vs driver signal
- (b) Capacitance
- (c) Conversion loss
- (d) Harmonic

(9) Detector Diode:

- (a) TSS vs driver signal
- (b) Pulse parameters

A system computer will be selected between the HP300 series and the IBM PC/XT. The problem with the HP300 computer is its possible non-compatibility with the HP8510. The problem with the HP9836 computer is its potential obsolescence. On the other hand the IBM PC/XT is a popular computer and will assure a wider support from the industries. We now have to ensure that EESOF Corporation will provide all communication software support between the HP8510 and the IBM PC/XT before we make a final selection on the computer.

END

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