

The documentation and process conversion measures necessary to comply with this document shall be completed by 12 July, 2001.

INCH-POUND

MIL-PRF-19500/385D
 12 April 2001
 SUPERSEDING
 MIL-PRF-19500/385C
 19 July 2000

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTORS, N-CHANNEL, SILICON
 TYPES 2N4856 THROUGH 2N4861, JAN, JANTX, JANTXV, JANS, AND UB

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the performance requirements for N-channel, depletion mode, silicon J-FET transistors. Five levels of product assurance are provided for each device type as specified in MIL-PRF-19500.

1.2 Physical dimensions. See figure 1 (similar to TO-18) and figure 2.

1.3 Maximum ratings. $T_A = +25^\circ\text{C}$, unless otherwise specified.

P _T (1) T _A = +25°C	P _T (2) T _C = +25°C	V _{DS} , V _{DG}		V _{GS}		I _G	T _J and T _{STG}
		2N4856 2N4857 2N4858	2N4859 2N4860 2N4861	2N4856 2N4857 2N4858	2N4859 2N4860 2N4861		
<u>W</u> 0.36	<u>W</u> 1.8	<u>V dc</u> 40	<u>V dc</u> 30	<u>V dc</u> -40	<u>V dc</u> -30	<u>mA dc</u> 50	<u>°C</u> -65 to +200

- (1) Derate linearly 2.06 mW/°C for $T_A > +25^\circ\text{C}$.
- (2) Derate linearly 10.3 mW/°C for $T_C > +25^\circ\text{C}$.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Supply Center, Columbus, ATTN: DSCC/VAC, Post Office Box 3990, Columbus, OH 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A
 DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 5961

MIL-PRF-19500/385D

1.4 Primary electrical characteristics.

	I _{DSS} (1) V _{DS} = 15 V dc V _{GS} = 0			V _{DS(on)}			V _{GS(off)} V _{DS} = 15 dc I _D = 0.5 nA dc		
				V _{GS} = 0 I _D = 20 mA dc	V _{GS} = 0 I _D = 10 mA dc	V _{GS} = 0 I _D = 5 mA dc			
	2N4856 2N4859	2N4857 2N4860	2N4858 2N4861	2N4856 2N4859	2N4857 2N4860	2N4858 2N4861	2N4856 2N4859	2N4857 2N4860	2N4858 2N4861
	<u>mA dc</u>	<u>mA dc</u>	<u>mA dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>
Min	50	20	8				-4	-2	-0.8
Max	175	100	80	0.75	0.50	0.50	-10	-6	-4

	r _{ds(on)}			R _{θJA}	R _{θJC}
	V _{GS} = 0; I _D = 1.0 mA dc I _d = 100 μA ac(rms), f = 1 kHz				
	2N4856 2N4859	2N4857 2N4860	2N4858 2N4861		
	<u>Ω</u>	<u>Ω</u>	<u>Ω</u>	<u>°C/mW</u>	<u>°C/mW</u>
Min				0.486	0.097
Max	25	40	60		

(1) Pulsed (see 4.5.1).

2. APPLICABLE DOCUMENTS

2.1. General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2. Government documents.

2.2.1. Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

DEPARTMENT OF DEFENSE

MIL-PRF-19500 - Semiconductor Devices, General Specification for.

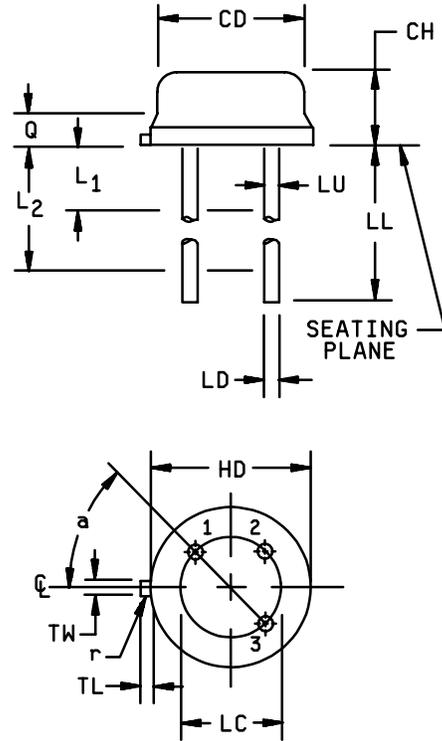
STANDARD

DEPARTMENT OF DEFENSE

MIL-STD-750 - Test Methods for Semiconductor Devices.

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Document Automation and Production Services (DAPS), Building 4D (DPM-DODSSP), 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

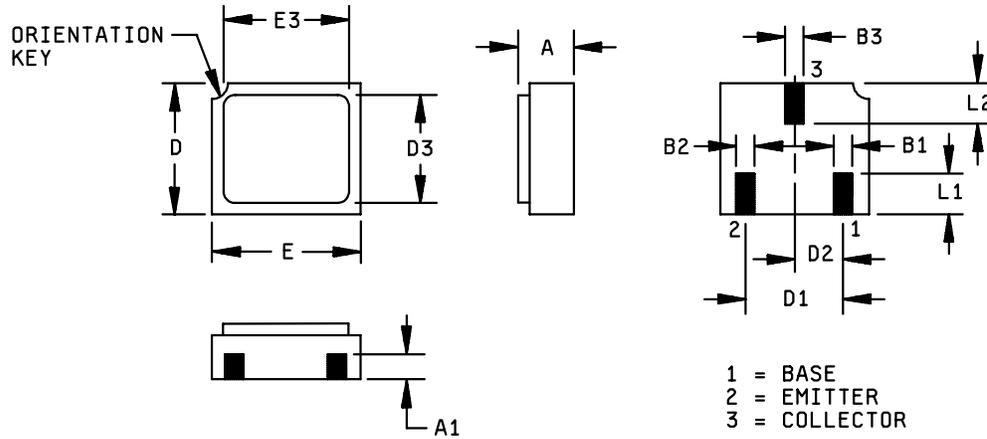
Symbol	Dimensions (see notes 1, 2, 9, 11, 12)				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.84	
LC	.100 TP		2.54 TP		6
LD	.016	.021	0.41	0.53	7, 8
LL	.500	.750	12.70	19.05	7, 8
LU	.016	.019	0.41	0.48	7, 8
L1	---	.050	---	1.27	5, 7, 8
L2	.250	---	6.35	---	7, 8
Q	---	.030	---	0.76	
TL	.028	.048	0.71	1.22	3, 4
TW	.036	.046	0.91	1.17	
r	---	.010	---	0.25	10
α	45° TP		45° TP		6



NOTES:

1. Dimension are in inches.
2. Metric equivalents are given for general information only.
3. Beyond r (radius) maximum, TL shall be held for a minimum length of .011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Outline in this zone is not controlled.
6. Leads at gauge plane .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
7. Dimension LU applies between L₁ and L₂. Dimension LD applies between L₂ and LL minimum. Diameter is uncontrolled in L₁ and beyond LL minimum.
8. All three leads.
9. The gate shall be internally connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. In accordance with ANSI Y14.5M, diameters are equivalent to ϕ x symbology.
12. Lead 1 = source, lead 2 = drain, lead 3 = gate.

FIGURE 1. Physical dimensions (similar to TO-18).



Symbol	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.046	0.056	0.97	1.42
A1	0.017	0.035	0.43	0.89
B1	0.016	0.024	0.41	0.61
B2	0.016	0.024	0.41	0.61
B3	0.016	0.024	0.41	0.61
D	0.085	0.108	2.41	2.74
D1	0.071	0.079	1.81	2.01
D2	0.035	0.039	0.89	0.99
D3	0.085	0.108	2.41	2.74
E	0.115	0.128	2.82	3.25
E3	---	0.128	---	3.25
L1	0.022	0.038	0.56	0.96
L2	0.022	0.038	0.56	0.96

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 2. Physical dimensions, surface mount (UB version).

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-19500.

3.2 Qualification. Devices furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturer's list (QML) before contract award (see 4.2 and 6.3).

3.3 Abbreviations, symbols, and definitions. Abbreviations, symbols, and definitions used herein shall be as specified in MIL-PRF-19500.

3.4 Interface and physical dimensions. The interface and physical dimensions shall be as specified in MIL-PRF-19500 and on figures 1 and 2.

3.4.1 Lead finish. Unless otherwise specified, lead finish shall be solderable in accordance with MIL-PRF-19500, MIL-STD-750, and herein. Where a choice of lead finish is desired, it shall be specified in the acquisition document (see 6.2).

3.5 Electrostatic discharge protection. The devices covered by this specification require electrostatic protection.

3.5.1 Handling. MOS devices must be handled with certain precautions to avoid damage due to the accumulation of electrostatic charge. The following handling practices shall be followed:

- a. Devices shall be handled on benches with conductive handling devices.
- b. Ground test equipment, tools, and personnel handling devices.
- c. Do not handle devices by the leads.
- d. Store devices in conductive foam or carriers.
- e. Avoid use of plastic, rubber, or silk in MOS areas.
- f. Maintain relative humidity above 50 percent, if practical.
- g. Care shall be exercised, during test and troubleshooting, to apply not more than maximum rated voltage to any lead.
- h. Gate must be terminated to source, $R \leq 100 \text{ k}\Omega$, whenever bias voltage is to be applied drain to source.

3.6 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in 1.3, 1.4, and table I.

3.7 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table I.

3.8 Marking. Marking shall be in accordance with MIL-PRF-19500. At the option of the manufacturer, marking may be omitted from the body, but shall be retained on the initial container.

3.9 Workmanship. Semiconductor devices shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance.

4 VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.2).
- b. Screening (see 4.3).
- c. Conformance inspection (see 4.4).

4.2 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-19500 and as specified herein.

4.3 Screening (JANS, JANTX, and JANTXV levels only). Screening shall be in accordance with table IV of MIL-PRF-19500 and as specified herein. The following measurements shall be made in accordance with table I herein. Devices that exceed the limits of table I herein shall not be acceptable.

Screen (see table IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
9	Not applicable	Not applicable
10	Not applicable	Not applicable
11	$I_{D(off)1}$, $r_{ds(on)}$, I_{GSS1} , and I_{DSS}	$I_{D(off)1}$, $r_{ds(on)}$, I_{GSS1} , and I_{DSS}
12	See 4.3.1	See 4.3.1
13	Subgroups 2 and 3 of table I herein; $\Delta I_{DSS} = \pm 15$ percent; $\Delta r_{ds(on)} = \pm 20$ percent; $\Delta I_{D(off)1} = .1$ nA or ± 100 percent of initial value. $\Delta I_{GSS1} = \pm 0.1$ nA or ± 100 percent of initial value, whichever is greater.	Subgroup 2 of table I herein; $\Delta I_{DSS} = \pm 15$ percent; $\Delta r_{ds(on)} = \pm 20$ percent; $\Delta I_{D(off)1} = .1$ nA or ± 100 percent of initial value. $\Delta I_{GSS1} = \pm 0.1$ nA or ± 100 percent of initial value, whichever is greater.

4.3.1 Power burn-in. Power burn-in conditions are in accordance with method 1039 of MIL-STD-750, condition A and as follows: $T_A \geq +150^\circ\text{C}$; $V_{GS} = 80$ percent of rated, $V_{DS} = 0$. NOTE: No heatsink or forced air cooling on the devices shall be permitted.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with MIL-PRF-19500, and table I herein.

MIL-PRF-19500/385D

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in tables VIa (JANS) and VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500 and 4.4.2.1 and 4.4.2.2 herein. Electrical measurements (end-points) shall be in accordance with table I, group A, subgroup 2 herein. Delta measurements shall be in accordance with table II herein.

4.4.2.1 Group B inspection, table VIa (JANS) of MIL-PRF-19500.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B4	1037	$P_T = 360 \text{ mW}$ at $T_A = +30^\circ\text{C}, \pm 5^\circ\text{C}$; 2000 cycles.
B5	1027	96 hours; $V_{DS} = 15 \text{ V dc}$; $I_D = 24 \text{ mA}$ at $T_A = +100^\circ\text{C}$; or adjust as required by the chosen T_A to give an average lot $T_J = +275^\circ\text{C}$.
B6	3151	$T_1 = +25^\circ\text{C}$, $T_2 = +125^\circ\text{C}$, $R_{\theta JA} \leq 486^\circ\text{C/W}$.

4.4.2.2 Group B inspection, table VIb (JAN, JANTX, and JANTXV) of MIL-PRF-19500.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1027	2N4856, 2N4857, 2N4858 = $V_{GS} = -32 \text{ V dc}$, 2N4859, 2N4860, 2N4861 = $V_{GS} = -24 \text{ V dc}$, at $T_A = +175^\circ\text{C} \pm 5^\circ\text{C}$; $V_{DS} = 0 \text{ V}$.

4.4.3 Group C inspection. Group C inspection shall be conducted in accordance with the conditions specified for subgroup testing in table VII of MIL-PRF-19500, and as follows. Electrical measurements (end-points) shall be in accordance with table I, group A, subgroup 2 herein. Delta measurements shall be in accordance with table II herein.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
C2	2036	Test condition E.
C6	1027	2N4856, 2N4857, 2N4858 = $V_{GS} = -32 \text{ V dc}$, 2N4859, 2N4860, 2N4861 = $V_{GS} = -24 \text{ V dc}$, at $T_A = +175^\circ\text{C} \pm 5^\circ\text{C}$; $V_{DS} = 0 \text{ V}$.

4.5 Methods of inspection. Methods of inspection shall be as specified in the appropriate tables and as follows.

4.5.1 Pulse measurements. Conditions for pulse measurement shall be as specified in section 4 of MIL-STD-750.

MIL-PRF-19500/385D

TABLE I. Group A inspection.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical examination	2071					
<u>Subgroup 2</u>						
Gate to source breakdown voltage 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	3401	Bias condition C; $I_G = -1.0 \mu\text{A dc}$; $V_{DS} = 0$	$V_{(BR)GSS}$	-40 -30		V dc V dc
Gate reverse current 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	3411	Bias condition C; $V_{DS} = 0$ $V_{GS} = -20 \text{ V dc}$ $V_{GS} = -15 \text{ V dc}$	I_{GSS1}		-0.25 -0.25	nA dc nA dc
Drain current cutoff	3413	Bias condition A, $V_{DS} = 15 \text{ V dc}$, $V_{GS} = -10 \text{ V dc}$	$I_{D(off)1}$		0.25	nA dc
Drain current zero-gate voltage 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3413	Bias condition C, $V_{DS} = 15 \text{ V dc}$, $V_{GS} = 0$, pulsed (see 4.5.1)	I_{DSS}	50 20 8	175 100 80	mA dc mA dc mA dc
Drain to source "on" state voltage 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3405	Bias condition B, $V_{GS} = 0$ $I_D = 20 \text{ mA dc}$ $I_D = 10 \text{ mA dc}$ $I_D = 5 \text{ mA dc}$	$V_{DS(on)}$		0.75 0.50 0.50	V dc V dc V dc
Gate to source "off" state voltage 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3403	$V_{DS} = 15 \text{ V dc}$, $I_D = 0.5 \text{ nA dc}$	$V_{GS(off)}$	-4 -2 -8	-10 -6 -4	V dc V dc V dc
Static drain to source "on" state resistance 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3421	$V_{GS} = 0$; $I_D = 1.0 \text{ mA dc}$	$r_{ds(on)}$		25 40 60	Ω Ω Ω

See footnote at end of table.

TABLE I. Group A inspection - Continued.

Inspection ^{1/}	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High temperature operation:						
Gate reverse current 2N4856, 2N4857, 2N4858 2N4859, 2N4860, 2N4861	3411	$T_A = +150^\circ\text{C}$ Bias condition C; $V_{DS} = 0\text{ V}$ $V_{DS} = -20\text{ V dc}$ $V_{DS} = -15\text{ V dc}$	I_{GSS2}		-0.5 -0.5	$\mu\text{A dc}$ $\mu\text{A dc}$
Drain current	3413	Bias condition A, $V_{DS} = 15\text{ V dc}$; $V_{GS} = -10\text{ V dc}$	$I_{D(off)2}$		0.5	$\mu\text{A dc}$
<u>Subgroup 4</u>						
Small-signal common-source short-circuit input capacitance	3431	$V_{DS} = 0, V_{GS} = -10\text{ V}; f = 1\text{ MHz};$ $C_1 = .1\ \mu\text{F}, C_2 = 20.1\ \mu\text{F}$ $L_1 = L_2 = \geq 500\ \mu\text{H}$	C_{iss}		18	pF
Small-signal common-source short-circuit reverse transfer capacitance	3433	$V_{DS} = 0, V_{GS} = -10\text{ V}; f = 1\text{ MHz}; C_1 = .1\ \mu\text{F},$ $L_1 = L_2 = \geq 500\ \mu\text{H}$	C_{rss}		8	pF
Turn-on delay time 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3459	See figure 3	$t_{d(on)}$		6 6 10	ns ns ns
Rise time 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3459	See figure 3	t_r		3 4 10	ns ns ns
Turn-off delay time 2N4856, 2N4859 2N4857, 2N4860 2N4858, 2N4861	3459	See figure 3	$t_{d(off)}$		25 50 100	ns ns ns
<u>Subgroups 5, 6, and 7</u>						
Not applicable						

^{1/} For sampling plan, see MIL-PRF-19500.

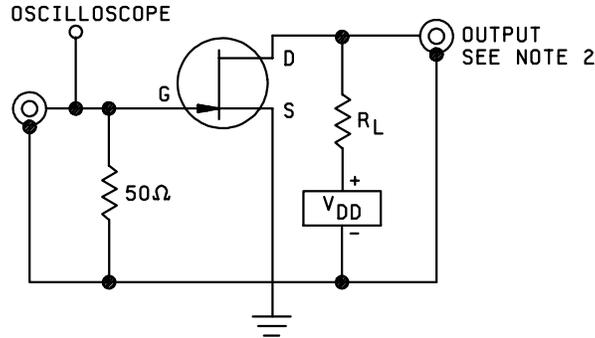
TABLE II. Groups B and C delta measurements. 1/ 2/ 3/

Step	Inspection	MIL-STD-750		Symbol	Limit	Unit
		Method	Conditions			
1.	Static drain to source "on"-state resistance	3421	$V_{GS} = 0$; $I_{DS} = 1.0$ mA dc	$\Delta r_{DS(on)}$	± 25 percent change from previously measured value. <u>1/</u>	
2.	Drain current	3413	Bias condition C; $V_{DS} = 15$ V dc, $V_{GS} = 0$; pulsed (see 4.5.1)	ΔI_{DSS1}	± 15 percent change from previously measured value. <u>1/</u>	

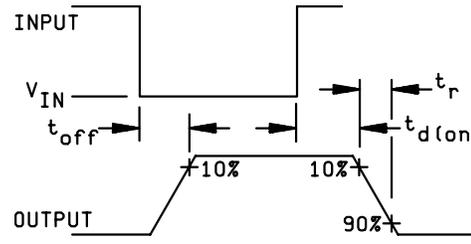
1/ Devices which exceed the group A limits for this test shall be rejected.

2/ The delta measurements for table VIa (JANS) of MIL-PRF-19500 are as follows: Subgroup 5, see table II herein, steps 1 and 2.

3/ The delta measurements for table VII of MIL-PRF-19500 are as follows: Subgroup 6, table II herein, steps 1 and 2 (for JANS only).



TEST CIRCUIT



VOLTAGE WAVEFORMS

TEST CONDITIONS AND COMPONENT VALUE						
Type	V _{DD}	V _{GS(on)}	V _{GS(off)}	R _L	V _{IN}	I _{D(on)} (1)
	V dc	V dc	V dc	Ω	V dc	mA dc
2N4856, 2N4859	10	0	-10	464	-10	20
2N4857, 2N4870	10	0	-6	953	-6	10
2N4858, 2N4861	10	0	-4	1,910	-4	5

(1) Nominal value; exact value varies slightly with transistor parameters.

NOTES:

- The input waveform has the following characteristics:
 $t_p = 200 \text{ ns}$; $t_r \leq 1 \text{ ns}$; duty cycle ≈ 2 percent.
 It is supplied by a generator with $Z_{out} = 50 \text{ } \Omega$.
- Waveforms are monitored on an oscilloscope with the following characteristics:
 $t_r \leq 0.75 \text{ ns}$; $R_{IN} \geq 1 \text{ M}\Omega$; $C_{IN} \leq 2.5 \text{ pF}$.

FIGURE 3. Switching time test circuit.

5. PACKAGING

5.1. Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Points' packaging activity within the Military Department or Defense Agency, or within the Military Departments' System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1. Intended use. The notes specified in MIL-PRF-19500 are applicable to this specification.

6.2. Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2.1).
- c. Lead finish (see 3.4.1).
- d. Type designation and product assurance level.
- e. Packaging requirements (see 5.1).

6.3. Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-19500 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Defense Supply Center, Columbus, ATTN: DSCC-VQE, P.O. Box 3990, Columbus, OH 43216-5000.

6.4. Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Army - CR
Navy - NW
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5961-2417)

Review activities:
Air Force - 99

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE
	MIL-PRF-19500/385D	12 April 2001

3. DOCUMENT TITLE
SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTORS, N-CHANNEL, SILICON TYPES 2N4856 THROUGH 2N4861, JAN, JANTX, JANTXV, JANS, AND UB.

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle initial)	b. ORGANIZATION		
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code)	7. DATE SUBMITTED	
	COMMERCIAL DSN FAX EMAIL		

8. PREPARING ACTIVITY

a. Point of Contact Alan Barone	b. TELEPHONE Commercial DSN FAX EMAIL 614-692-0510 850-0510 614-692-6939 alan_barone@dsccl.dla.mil
c. ADDRESS Defense Supply Center, Columbus, ATTN: DSCC-VAC, P.O. Box 3990 Columbus, OH 43216-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman, Suite 2533 Fort Belvoir, VA 22060-6221 Telephone (703) 767-6888 DSN 427-6888