

The documentation and process conversion measures necessary to comply with this revision shall be completed by 9 July 2003.

INCH-POUND

MIL-PRF-19500/476C  
 9 April 2003  
 SUPERSEDING  
 MIL-PRF-19500/476B  
 15 October 2001

PERFORMANCE SPECIFICATION

SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTORS, P-CHANNEL, SILICON  
 TYPES 2N5114 THROUGH 2N5116 AND 2N5114UB THROUGH 2N5116UB  
 JAN, JANTX, AND JANTXV

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 P-channel, junction, silicon field-effect transistors. Three 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-18) and figure 2 (UB, surface mount).

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

$P_T$ (1) $T_A = +25^\circ\text{C}$	$V_{GS}$ (2)	$V_{DS}$	$V_{DG}$ (2)	$I_G$	$T_{STG}$
<u>W</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u>mA dc</u>	<u>°C</u>
0.500	30	30	30	50	-65 to +200

(1) Derate linearly 3.0 mW/°C for  $T_A = +25^\circ\text{C}$ .

(2) Symmetrical geometry allows operation of those units with source/drain leads interchanged.

1.4 Primary electrical characteristics.

Limits	$I_{DSS}$ (1)			$V_{DS(on)}$		
	$V_{DS} = -18\text{ V dc}$ $V_{GS} = 0$	$V_{DS} = -15\text{ V dc}$ $V_{GS} = 0$	$V_{DS} = -15\text{ V dc}$ $V_{GS} = 0$	$I_D = -15\text{ mA dc}$ $V_{GS} = 0$	$I_D = -7\text{ mA dc}$ $V_{GS} = 0$	$I_D = -3\text{ mA dc}$ $V_{GS} = 0$
	2N5114 2N5114UB	2N5115 2N5115UB	2N5116 2N5116UB	2N5114 2N5114UB	2N5115 2N5115UB	2N5116 2N5116UB
	<u>mA dc</u>	<u>mA dc</u>	<u>mA dc</u>	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>
Min	-30	-15	-5.0	-1.3	-0.8	-0.6
Max	-90	-60	-25			

(1) For  $T_A > +25^\circ\text{C}$ , derate linearly 1.67 mW/°C one section, 2.67 mW/°C both sections.

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, P.O. 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.

1.4 Primary electrical characteristics - Continued.

Limits	$V_{GS(off)}$			$r_{ds(on)2}$		
	$V_{DS} = 15 \text{ V dc}$ $I_D = -1.0 \text{ nA dc}$		$V_{DS} = -15 \text{ V dc}$ $I_D = 1.0 \text{ } \mu\text{A dc}$	$V_{GS} = 0$ $I_D = 0$ $f = 1 \text{ kHz}$		
	2N5114 2N5114UB	2N5115 2N5115UB	2N5116 2N5116UB	2N5114 2N5114UB	2N5115 2N5115UB	2N5116 2N5116UB
	<u>V dc</u>	<u>V dc</u>	<u>V dc</u>	<u><math>\Omega</math></u>	<u><math>\Omega</math></u>	<u><math>\Omega</math></u>
Min	5	3	1			
Max	10	6	4	75	100	175

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

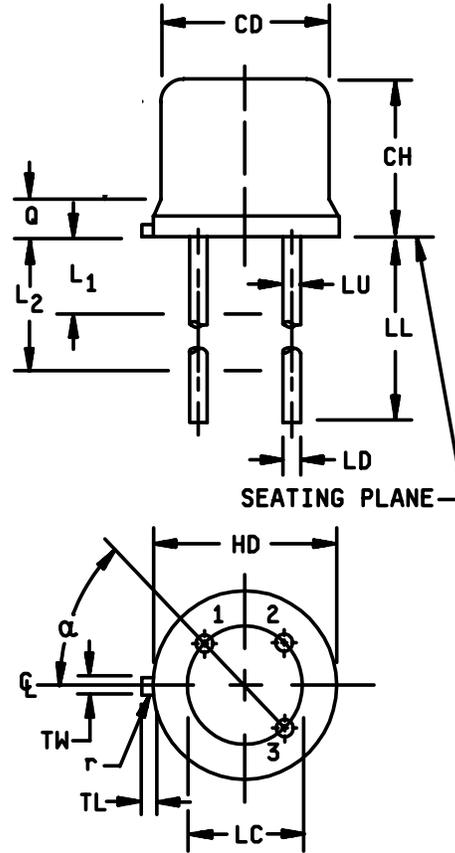
DEPARTMENT OF DEFENSE

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.)

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.

Symbol	Dimensions				Note
	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	12.7	19.05	7,8
LU	.016	.019	0.41	0.48	7,8
L1		.050		1.27	7,8
L2	.250		6.35		7,8
Q		.030		0.76	5
TL	.028	.048	0.71	1.22	3,4
TW	.036	.046	0.91	1.17	
r		.010		0.25	10
$\alpha$	45° TP		45° TP		6

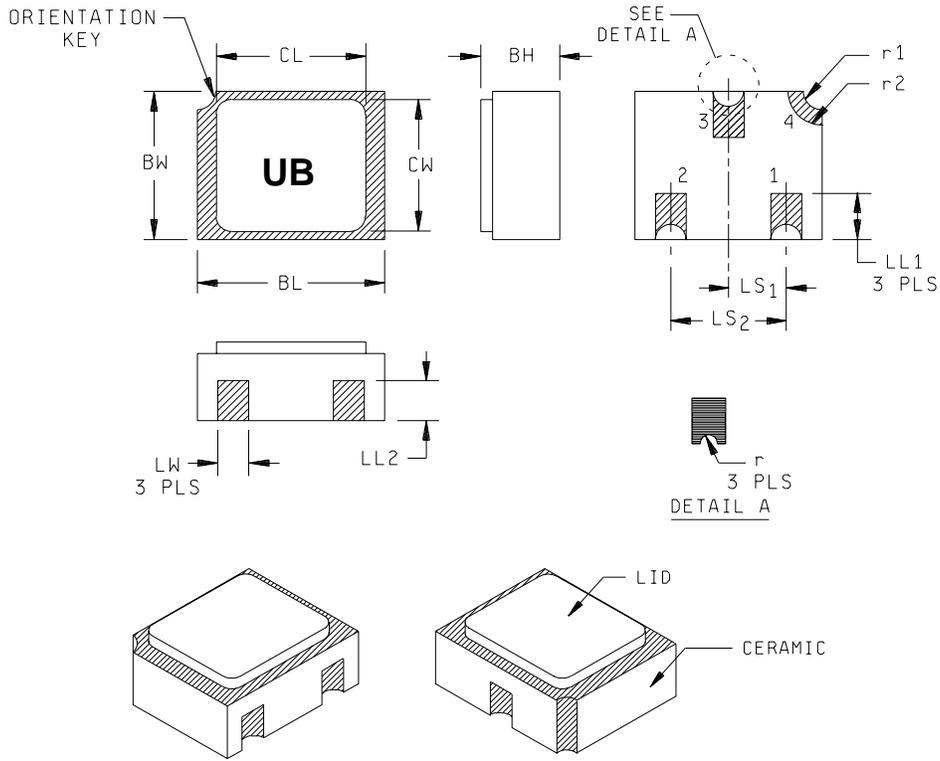


NOTES:

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. Body contour optional within zone defined by HD, CD, and Q.
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. The device may be measured by direct methods or by the gauge and gauging procedure shown on figure 2.
7. Dimension LU applies between L<sub>1</sub> and L<sub>2</sub>. Dimension LD applies between L<sub>2</sub> and LL minimum. Diameter is uncontrolled in L<sub>1</sub> and beyond LL minimum.
8. All three leads.
9. The gate shall be electrically connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. In accordance with ASME Y14.5M, diameters are equivalent to  $\phi$ x symbology.
12. Lead 1 = source, lead 2 = gate, lead 3 = drain.

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

MIL-PRF-19500/476C



Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
BH	.046	.056	1.17	1.42	
BL	.115	.128	2.92	3.25	
BW	.085	.108	2.16	2.74	
CL		.128		3.25	
CW		.108		2.74	
LL1	.022	.038	0.56	0.96	
LL2	.017	.035	0.43	0.89	
LS1	.036	.040	0.91	1.02	
LS2	.071	.079	1.81	2.01	
LW	.016	.024	0.41	0.61	
r		.008		.203	
r1		.012		.305	
r2		.022		.559	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Hatched areas on package denote metallized areas (tungsten with gold plating 60 micro inches min over 80 micro inches min nickel).
4. Pad 1 = Source, Pad 2 = Drain, Pad 3 = Gate, Pad 4 = Shielding connected to the lid.

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

### 3. REQUIREMENTS

\* 3.1 General. The individual item requirements shall be as specified in MIL-PRF-19500 and as modified herein.

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. Interface and physical dimensions shall be as specified in MIL-PRF-19500, and on figures 1 (similar to T0-18) and 2 (UB, surface mount) herein.

3.4.1 Lead finish. 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 Marking. Marking shall be in accordance with MIL-PRF-19500.

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

3.6.1 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,  $R \leq 100 \text{ k}$ , whenever bias voltage is to be applied drain to source.

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

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

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).

MIL-PRF-19500/476C

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

4.3 Screening (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
	JANTX and JANTXV levels
3a	Temperature cycling
10	Not applicable
11	$I_{D(off)1}$ , $r_{ds(on)1}$
12	See 4.3.1
13	Subgroup 2 of table I herein; $\Delta I_{D(off)1} = \pm 0.5$ nA dc or $\pm 100$ percent of initial value, whichever is greater. $\Delta r_{ds(on)1} = \pm 20$ percent of initial value.

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:  $T_A = +150^\circ\text{C}$ ;  $V_{GS} = 24$  V dc;  $V_{DS} = 0$ .

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.

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

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

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
B3	1027	$V_{GS} = 24$ V dc; $T_A = +125^\circ\text{C}$ ; $V_{DS} = 0$ .
B6	1032	$T_A = +175^\circ\text{C}$ .

\* 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, subgroup 2 herein.

<u>Subgroup</u>	<u>Method</u>	<u>Condition</u>
-----------------	---------------	------------------

C2	1056	Thermal shock: Test condition C-1, time at temperature extremes = 15 minutes minimum.
----	------	---

C2	2036	Lead fatigue: Test condition E (not applicable to UB suffix devices.)
----	------	---

C6	1026	$V_{GS} = 24 \text{ V dc}$ ; $T_A = +125^\circ\text{C}$ ; $V_{DS} = 0$ .
----	------	--

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-19500/476C

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	3401	Bias condition C; $I_G = 1.0 \mu\text{A dc}$ ; $V_{DS} = 0$	$V_{(BR)GSS}$	30		V dc
Gate reverse current	3411	Bias condition C; $V_{GS} = 20 \text{ V dc}$ ; $V_{DS} = 0$	$I_{GSS}$		500	pA dc
Drain cutoff current	3413	Bias condition A	$I_{D(off)1}$			
2N5114, 2N5114UB		$V_{DS} = -15 \text{ V dc}$ ; $V_{GS} = 12 \text{ V dc}$			-500	pA dc
2N5115, 2N5115UB		$V_{DS} = -15 \text{ V dc}$ ; $V_{GS} = 7.0 \text{ V dc}$			-500	pA dc
2N5116, 2N5116UB		$V_{DS} = -15 \text{ V dc}$ ; $V_{GS} = 5.0 \text{ V dc}$			-500	pA dc
Zero-gate-voltage drain current	3413	Bias condition C; $V_{DS}$ to be pulsed see 4.5.1	$I_{DSS}$			
2N5114, 2N5114UB		$V_{DS} = -18 \text{ V dc}$ ; $V_{GS} = 0$		-30	-90	mA dc
2N5115, 2N5115UB		$V_{DS} = -15 \text{ V dc}$ ; $V_{GS} = 0$		-15	-60	mA dc
2N5116, 2N5116UB		$V_{DS} = -15 \text{ V dc}$ ; $V_{GS} = 0$		-5.0	-25	mA dc
Drain to source "on" voltage	3405		$V_{DS(on)}$			
2N5114, 2N5114UB		$I_D = -15 \text{ mA dc}$ ; $V_{GS} = 0$			-1.3	V dc
2N5115, 2N5115UB		$I_D = -7.0 \text{ mA dc}$ ; $V_{GS} = 0$			-0.8	V dc
2N5116, 2N5116UB		$I_D = -3.0 \text{ mA dc}$ ; $V_{GS} = 0$			-0.6	V dc
Gate to source cutoff voltage	3403		$V_{GS(off)}$			
2N5114, 2N5114UB		$V_{DS} = -15 \text{ V dc}$ ; $I_D = -1.0 \text{ nA dc}$		5.0	10	V dc
2N5115, 2N5115UB		$V_{DS} = -15 \text{ V dc}$ ; $I_D = -1.0 \text{ nA dc}$		3.0	6.0	V dc
2N5116, 2N5116UB		$V_{DS} = -15 \text{ V dc}$ ; $I_D = -1.0 \text{ nA dc}$		1.0	4.0	V dc
Small-signal drain to source "on" resistance	3423	$V_{GS} = 0$ ; $I_D = -1 \text{ mA dc}$	$r_{ds(on)1}$			
2N5114, 2N5114UB					75	$\Omega$
2N5115, 2N5115UB					100	$\Omega$
2N5116, 2N5116UB					175	$\Omega$
Small-signal drain to source "on" resistance	3423	$V_{GS} = 0$ ; $I_D = 0$ ; $f = 1 \text{ kHz}$	$r_{ds(on)2}$			
2N5114, 2N5114UB					75	$\Omega$
2N5115, 2N5115UB					100	$\Omega$
2N5116, 2N5116UB					175	$\Omega$

See footnote at end of table.

MIL-PRF-19500/476C

TABLE I. Group A inspection - Continued.

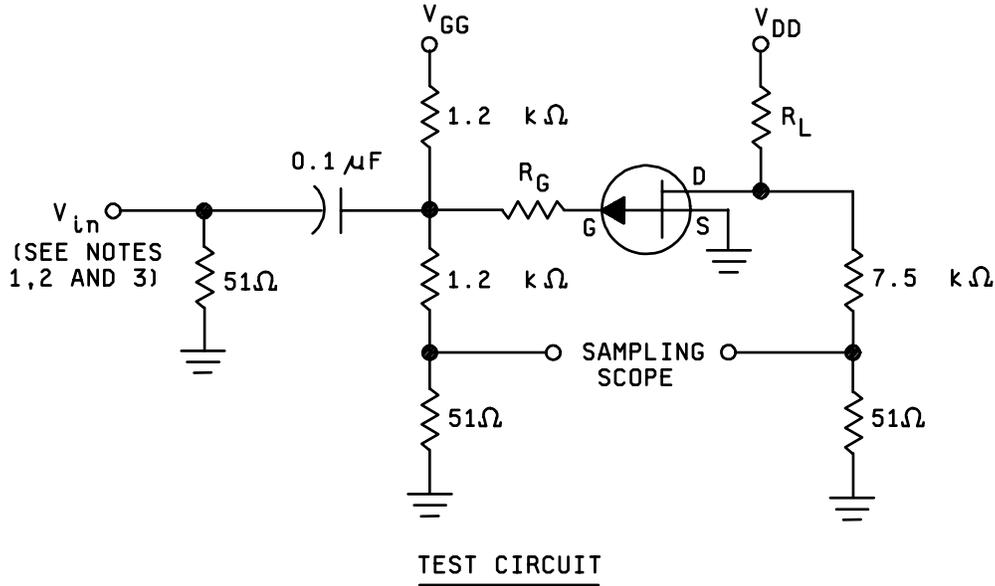
Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u>						
High temperature operation:						
Gate reverse current	3411	Bias condition C; $T_A = +150^\circ\text{C}$ ; $V_{GS} = 20\text{ V dc}$ ; $V_{DS} = 0$	$I_{GSS}$		1.0	$\mu\text{A dc}$
Drain cutoff current	3413	Bias condition A; $T_A = +150^\circ\text{C}$	$I_{D(off)2}$			
2N5114, 2N5114UB		$V_{GS} = 12\text{ V dc}$ ; $V_{DS} = -15\text{ V dc}$			-1.0	$\mu\text{A dc}$
2N5115, 2N5115UB		$V_{GS} = 7.0\text{ V dc}$ ; $V_{DS} = -15\text{ V dc}$			-1.0	$\mu\text{A dc}$
2N5116, 2N5116UB		$V_{GS} = 5.0\text{ V dc}$ ; $V_{DS} = -15\text{ V dc}$			-1.0	$\mu\text{A dc}$
<u>Subgroup 4</u>						
Small-signal common-source short-circuit input capacitance	3431	$V_{DS} = -15\text{ V dc}$ ; $V_{GS} = 0$ $f = 1\text{ MHz}$	$C_{iss}$			
2N5114, 2N5114UB					25	pF
2N5115, 2N5115UB					25	pF
2N5116, 2N5116UB					27	pF
Small-signal common-source short-circuit reverse transfer capacitance	3433		$C_{rss}$			
2N5114, 2N5114UB		$V_{DS} = 0$ ; $V_{GS} = 12\text{ V dc}$			7.0	pF
2N5115, 2N5115UB		$V_{DS} = 0$ ; $V_{GS} = 7.0\text{ V dc}$			7.0	pF
2N5116, 2N5116UB		$V_{DS} = 0$ ; $V_{GS} = 5.0\text{ V dc}$			7.0	pF
Turn-on delay time	3459	See figure 3	$t_{d(on)}$			
2N5114, 2N5114UB					6	ns
2N5115, 2N5115UB					10	ns
2N5116, 2N5116UB					25	ns
Rise time	3459	See figure 3	$t_r$			
2N5114, 2N5114UB					10	ns
2N5115, 2N5115UB					20	ns
2N5116, 2N5116UB					35	ns
Turn-off delay time	3459	See figure 3	$t_{d(off)}$			
2N5114, 2N5114UB					6	ns
2N5115, 2N5115UB					8	ns
2N5116, 2N5116UB					20	ns

See footnote at end of table

TABLE I. Group A inspection - Continued.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 4</u> - Continued Fall time 2N5114, 2N5114UB 2N5115, 2N5115UB 2N5116, 2N5116UB  <u>Subgroups 5 and 6</u> Not applicable	3459	See figure 3	t <sub>f</sub>		15 30 60	ns ns ns

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



Test conditions and component value					
Type	V <sub>DD</sub>	V <sub>GG</sub>	R <sub>L</sub>	R <sub>G</sub>	I <sub>D(ON)</sub> (1)
	V dc	V dc	ohms	ohms	μA dc
2N5114, 2N5114UB	-10	20	430	100	-15
2N5115, 2N5115UB	-6.0	12	910	220	-7.0
2N5116, 2N5116UB	-6.0	8.0	2,000	390	-3.0

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

**NOTES:**

1. The input waveform has the following characteristics:  $t_p = 100$  ns;  $t_r \leq 1$  ns;  $t_f \leq 1$  ns; duty cycle  $\approx 2$  percent. It is supplied by a generator with  $Z_{out} = 50$  ohms.
2. Resistor tolerance is  $\pm 10$  percent.
3. Voltage limits for the  $V_{in}$  voltage (input switching levels) are as follows:
 

2N5114, 2N5114UB	$V_{in} = 11$ V dc (from 0 v to -11 V dc signal level).
2N5115, 2N5115UB	$V_{in} = 7$ V dc (from 0 v to -7 V dc signal level).
2N5116, 2N5116UB	$V_{in} = 5$ V dc (from 0 v to -5 V dc signal level).

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) 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. The margins of this specification are marked with asterisks to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:  
Army - CR  
Air Force - 11  
NASA - NA  
DLA - CC

Preparing activity:  
DLA - CC  
  
(Project 5961-2701)

Review activities:  
Army - AV, MI  
Air Force - 19, 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.

<b>I RECOMMEND A CHANGE:</b>	<b>1. DOCUMENT NUMBER</b> MIL-PRF-19500/476C	<b>2. DOCUMENT DATE</b> 9 April 2003
------------------------------	---	---

**3. DOCUMENT TITLE** SEMICONDUCTOR DEVICE, FIELD EFFECT TRANSISTORS, P-CHANNEL, SILICON TYPES 2N5114 THROUGH 2N5116 AND 2N5114UB THROUGH 2N5116UB, JAN, JANTX, AND JANTXV

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

**5. REASON FOR RECOMMENDATION**

<b>6. SUBMITTER</b>		
a. NAME (Last, First, Middle initial)	b. ORGANIZATION	
c. ADDRESS (Include Zip Code)	d. TELEPHONE (Include Area Code) Commercial DSN FAX EMAIL	7. DATE SUBMITTED

<b>8. PREPARING ACTIVITY</b>	
a. Point of Contact Alan Barone	b. TELEPHONE Commercial      DSN      FAX      EMAIL 614-692-0510    850-0510    614-692-6939    alan.barone@dla.mil
c. ADDRESS Defense Supply Center Columbus ATTN: DSCC-VAC P.O. Box 3990 Columbus, OH 43216-5000	<b>IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:</b> Defense Standardization Program Office (DLSC -LM) 8725 John J. Kingman Road, Suite 2533 Fort Belvoir, Virginia 22060-6221 Telephone (703) 767-6888    DSN 427-6888