

The documentation and process conversion measures necessary to comply with this revision shall be completed by 30 March 1998

INCH-POUND

MIL-PRF-19500/599C
30 December 1997
SUPERSEDING
MIL-S-19500/599B
31 March 1995

PERFORMANCE SPECIFICATION SHEET

SEMICONDUCTOR DEVICE, QUAD, FIELD EFFECT TRANSISTORS,
P-CHANNEL, SILICON TYPE 2N7335
JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

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 quad P-channel, enhancement-mode, MOSFET, power transistor. Four levels of product assurance are provided for each encapsulated device type as specified in MIL-PRF-19500, with avalanche energy ratings (E_{AS} and E_{AR}) and maximum avalanche current (I_{AR}). Two levels of product assurance for each unencapsulated device type die (element evaluation).

1.2 Physical dimensions. See figures 1 (MO-Q36AB) and 2 for JANHC and JANKC die dimensions.

1.3 Unless otherwise specified, maximum ratings ($T_A = +25^\circ\text{C}$).

Type	P_T 1/ $T_C = +25^\circ\text{C}$ (free air)	V_{GS}	I_{D1} 2/ $T_C = +25^\circ\text{C}$	I_{D2} 2/ $T_C = +100^\circ\text{C}$	I_S
2N7335	<u>W</u> 1.4	<u>V dc</u> ± 20	<u>A dc</u> -.75	<u>A dc</u> -0.50	<u>A dc</u> -.75

E_{AS}	E_{AR}	I_{AR} 2/	I_{DM} 3/	T_{op} and T_{STG}	Max $r_{DS(on)}$ 1/ $V_{GS} = 10 \text{ V dc}, I_D = I_{D2}$		$R_{\theta JA1}$ maximum (1 die)	$R_{\theta JA2}$ maximum (4 die)
					$T_J = +25^\circ\text{C}$	$T_J = +150^\circ\text{C}$		
<u>mJ</u>	<u>mJ</u>	<u>A</u>	<u>A(pk)</u>	<u>°C</u>	<u>Ω</u>	<u>Ω</u>	<u>°C/W</u>	<u>°C/W</u>
75	.14	-.75	-3.0	-55 to +150	1.4	2.5	90	50

1/ Derate linearly $0.011 \text{ }^\circ\text{C/W}$ for $T > +25^\circ\text{C}$. $P_T = \frac{T_J \text{ max} - T_C}{R_{\theta JA}}$

2/ $I_D = \sqrt{\frac{T_J(\text{max}) - T_C}{R_{\theta JA} \times (R_{DS(on)} \text{ at } T_J(\text{max}))}}$

3/ $I_{DM} = 4 I_{D1}; I_{D1}$ as calculated in footnote 2.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAT, 3990 East Broad Street, 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. at $T_C = +25^\circ\text{C}$.

Type	Min $V_{(BR)DSS}$ $V_{GS} = 0\text{ V}$ $I_D = 1\text{ mA dc}$	$V_{GS(th)1}$ $V_{DS} \geq V_{GS}$ $I_D = 0.25\text{ mA}$	Max I_{DSS1} $V_{GS} = 0\text{ V}$ $V_{DS} = 80\text{ percent of rated } V_{DS}$	Max $r_{DS(on)1}$ ^{1/} $V_{GS} = 10\text{ V dc}$ $I_D = I_{D2}$ $T_J = +25^\circ\text{C}$
	<u>V dc</u>	<u>V dc</u> <u>Min</u> <u>Max</u>	<u>μA dc</u>	<u>Ω</u>
2N7335	-100	-2.0 -4.0	-25	1.4

^{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

MILITARY

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

(Unless otherwise indicated, copies of the above specifications, standards, and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, 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 (except for related associated specifications or specification sheets), 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 Qualification. Devices furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.2 and 6.3).

3.2 Associated specification. The individual item requirements shall be in accordance with MIL-PRF-19500 and as specified herein.

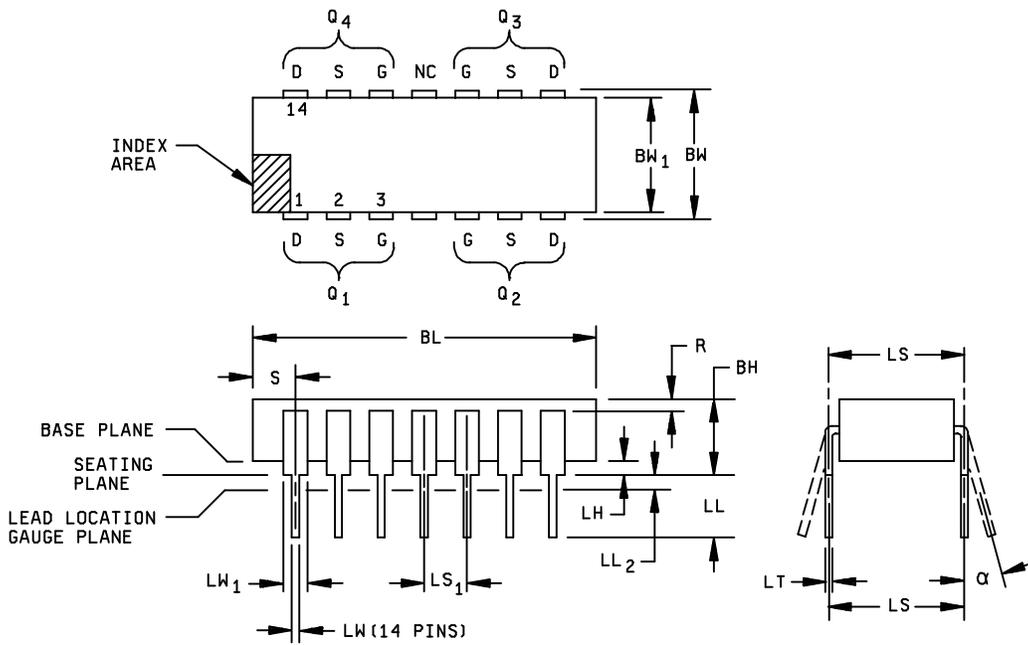


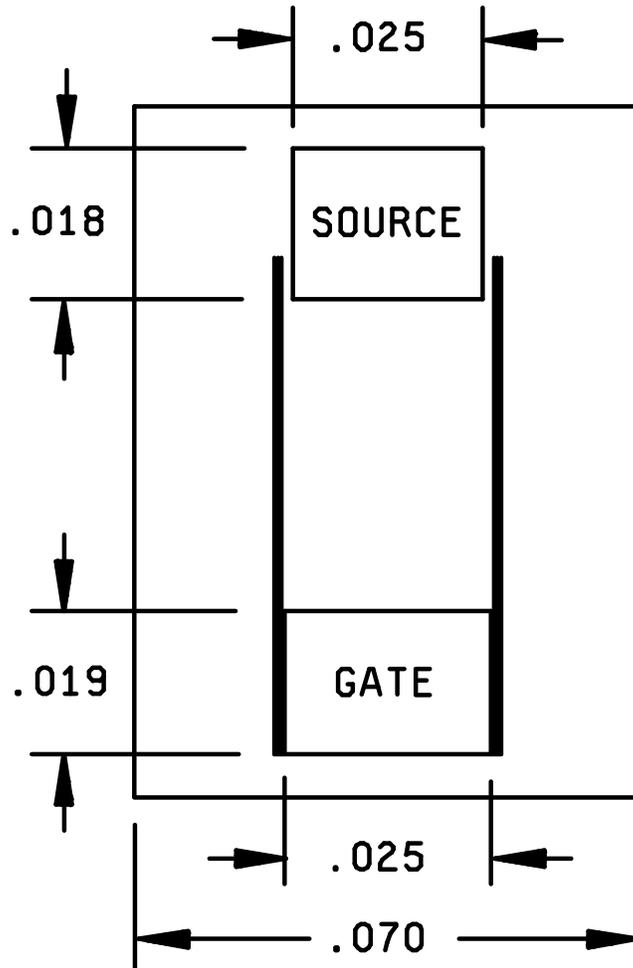
FIGURE 1. Dimensions and configuration (MO-Q36AB).

Symbol	Dimensions				Notes
	Inches				
	Min		Millimeters		
	.105	Max	Min	Max	
BH	.690	.175	2.67	4.45	11
BL	.290	.770	17.53	19.56	
BW	.280	.325	7.37	8.26	
BW ₁	.025	.310	7.11	7.87	10
LH	.125	.055	0.64	1.40	11
LL	.000	.175	3.18	4.45	11
LL ₁	.300 TP	.030	0.00	0.76	
LS	.100 TP		7.62 TP		5, 6
LS ₁	.008		2.54 TP		5, 6
LT	.015	.012	.203	.305	
LW	.038	.021	.381	.533	
LW ₁	14	.060	0.97	1.52	
N	.010		14		8
R	.030	---	0.25	---	
S	0°	.095	0.76	2.41	
α		15°	0°	15°	7

NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only.
- Refer to applicable symbol list.
- Dimensioning and tolerancing in accordance with ANSI Y14.5-1973.
- Leads within .13 mm (.005 in.) radius of True Position (TP) at gauge plane with maximum material condition and unit installed.
- LS₁ and LS applies in zone LL₂ when unit installed.
- α applies to spread leads prior to installation.
- N is the number of terminal positions.
- Outlines on which the seating plane is coincident with the base plane ($A_1 = 0$), terminals lead standoffs are not required, and LW₁ may equal LW along any part of the lead above the seating/base plane.
- BW₁ does not include particles of package materials.
- This dimension shall be measured with the device seated in the seating plane gauge JEDEC Outline No. GS-3.

FIGURE 1. Dimensions and configuration (MO-Q36AB) - Continued.



HEX-1: 100V, P-CHANNEL

Inches	mm
.018	0.46
.019	0.48
.025	0.64
.070	1.78

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ".005 inch (0.13 mm).
4. The physical characteristics of the die thickness are .0187 inch (0.474 mm). The back metals are chromium, nickel, and silver. The top metal is aluminum and the back contact is the drain.

FIGURE 2. JANHCA and JANKCA die dimensions.

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

3.4 Interface requirements and physical dimensions. The interface requirements and physical dimensions shall be as specified in MIL-PRF-19500 and on figure 1 herein.

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

3.4.2 Construction. These devices shall be constructed in a manner and using materials which enable the devices to meet the applicable requirements of MIL-PRF-19500 and this document.

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 # 100 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 herein.

3.8 Electrical test requirements. The electrical test requirements shall be the subgroups specified in 4.4.2 and 4.4.3 herein.

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 herein.

4.2.1 Group E inspection. Group E inspection shall be conducted in accordance with MIL-PRF-19500, and herein.

4.3 Screening (JANS, JANTX and JANTXV levels only). Screening shall be in accordance with MIL-PRF-19500 (Appendix E, table IV), 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 appendix E, table IV of MIL-PRF-19500)	Measurement	
	JANS level	JANTX and JANTXV levels
<u>1/ 2/</u>	Gate stress test (see 4.5.5)	Gate stress test (see 4.5.5)
<u>1/</u>	Method 3161 (see 4.5.3)	Method 3161 (see 4.5.3)
9	I _{GSS1} , I _{DSS1} , subgroup 2 of table I herein	Subgroup 2 of table II herein
10	Method 1042, test condition B	Method 1042, test condition B
11	I _{GSS1} , I _{DSS1} , r _{DS(on)1} , V _{GS(th)1} Subgroup 2 of table I herein; ΔI _{GSS1} = ± 20 nA dc or ± 100 percent of initial value, whichever is greater. ΔI _{DSS1} = ± 25 μA dc or ± 100 percent of initial value, whichever is greater.	I _{GSS1} , I _{DSS1} , r _{DS(on)1} , V _{GS(th)1} , subgroup 2 of table I herein
12	Method 1042, test condition A, t = 240 hours	Method 1042, test condition A
13	Subgroups 2 and 3 of table I herein; ΔI _{GSS1} = ± 20 nA dc or ± 100 percent of initial value, whichever is greater. ΔI _{DSS1} = ± 25 μA dc or ± 100 percent of initial value, whichever is greater. Δr _{DS(on)1} = ± 20 percent of initial value ΔV _{GS(th)1} = ± 20 percent of initial value	Subgroup 2 of table I herein; ΔI _{GSS1} = ± 20 nA dc or ± 100 percent of initial value, whichever is greater. ΔI _{DSS1} = ± 25 μA dc or ± 100 percent of initial value, whichever is greater. Δr _{DS(on)1} = ± 20 percent of initial value ΔV _{GS(th)1} = ± 20 percent of initial value

1/ Shall be performed anytime before screen 10.

2/ This is a stress test designed to insure a rugged product.

4.3.1 Screening (JANHC and JANKC). Screening shall be in accordance with MIL-PRF-19500 (appendix G). As a minimum, die shall be 100 percent probed in accordance with group A.

4.4 Conformance inspection. Conformance inspection shall be in accordance with MIL-PRF-19500, and as specified herein. Alternate flow is allowed for conformance inspection in accordance with MIL-PRF-19500.

4.4.1 Group A inspection. Group A inspection shall be conducted in accordance with appendix E, table V of MIL-PRF-19500, and table I herein. Electrical measurements (end-points) shall be in accordance with the applicable steps of table I, subgroup 2 herein. Delta requirements shall be in accordance with the applicable steps of table II herein.

4.4.2 Group B inspection. Group B inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table VIa (JANS) and table VIb (JANTX and JANTXV) of MIL-PRF-19500, and as follows. Electrical measurements (end-points) shall be in accordance with the applicable steps of table I, subgroup 2 herein. Delta requirements shall be in accordance with the applicable steps of table II herein.

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

Subgroup	Method	Conditions
B3	1051	Test condition G.
B4	1042	Not applicable.
B5	1042	Test condition A, $T_A = +175^\circ\text{C}$, $t = 120$ hours. Read and record $V_{BR(DSS)}$ (pre and post) at $I_D = 1$ mA. Read and record I_{DSS} (pre and post), in accordance with table III. Accelerated steady-state gate stress, method 1042, condition B, $T_A = +175^\circ\text{C}$, $t = 24$ hours.
B6	3161	See 4.5.2.

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

Subgroup	Method	Conditions
B2	1051	Test condition G.
B3	1042	Test condition A, $T_A = +150^\circ\text{C}$, $t = 160$ hours.
B3	1042	Test condition B, $T_A = +150^\circ\text{C}$, $t = 24$ hours.

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

4.4.3.1 Group C inspection, appendix E, table VII of MIL-PRF-19500.

Subgroup	Method	Conditions
C2	2036	Test condition E.
C6	1042	Test condition A, $T_A = +150^\circ\text{C}$, $t = 340$ hours.
C6	1042	Test condition B, $T_A = +150^\circ\text{C}$, $t = 24$ hours.

4.4.4 Group E inspection (except JANHC and JANKC). Group E inspection shall be conducted in accordance with the conditions specified for subgroup testing in appendix E, table IX of MIL-PRF-19500, and as follows. Electrical measurements (end-points) shall be in accordance with the applicable steps of table I, subgroup 2 herein. Delta requirements shall be in accordance with the applicable steps of table II herein.

4.4.4.1 Group E inspection, appendix E, table IX of MIL-PRF-19500.

Subgroup	Method	Conditions
E1	1051	Test condition G, 500 cycles; 45 devices, c = 0.
E1	1071	
E2	1042	Test condition A, 1,000 hours; 45 devices, c = 0.
E2	1042	Test condition B, 1,000 hours; 45 devices, c = 0.
E4	3161	$R_{\theta JA1} = 90^{\circ}\text{C/W}$ maximum see 4.5.2, sampling plan 5 devices, c = 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.

4.5.2 Thermal resistance. Thermal resistance measurements shall be performed in accordance with method 3161 of MIL-STD-750. $R_{\theta JA1}$ maximum = 90°C/W , for each die.

- a. I_M measuring current..... 10 mA.
- b. I_H drain heating current..... 0.15 A minimum.
- c. t_H heating time Steady-state (see method 3161 of MIL-STD-750 for definition).
- d. V_H drain-source heating voltage..... 15 V.
- e. t_{MD} measurement time delay..... 30 to 60 μs .
- f. t_{SW} sample window time..... 10 μs maximum.

4.5.3 Thermal impedance ($Z_{\theta JC}$ measurements). The $Z_{\theta JC}$ measurements shall be performed in accordance with method 3161 of MIL-STD-750. The maximum limit (not to exceed figure 3, thermal impedance curves and the group A, subgroup 2 limits) for $Z_{\theta JC}$ in screening (table IV of MIL-PRF-19500) shall be derived by each vendor by means of statistical process control. When the process has exhibited control and capability, the capability data shall be used to establish the fixed screening limit. In addition to screening, once a fixed limit has been established, monitor all future sealing lots using a random five piece sample from each lot to be plotted on the applicable X, R chart. If a lot exhibits an out of control condition, the entire lot shall be removed from the line and held for engineering evaluation and disposition. This procedure may be used in lieu of an inline process monitor.

- a. I_M measuring current..... 10 mA.
- b. I_H drain heating current..... 0.15 A minimum.
- c. t_H heating time 100 ms.
- d. V_H drain-source heating voltage..... 15 V minimum.
- e. t_{MD} measurement time delay..... 30 to 60 μs .
- f. t_{SW} sample window time..... 10 μs maximum.

4.5.4 Single pulse unclamped inductive switching.

- a. Peak current (I_{AS}) I_{D1} .
- b. Peak gate voltage (V_{GS}) -10 V.
- c. Gate to source resistor (R_{GS}) $25 \leq R_{GS} \leq 200\Omega$.
- d. Initial case temperature +25°C +10°C, -5°C.
- e. Inductance $\left[\frac{2 E_{AS}}{(I_{DI})^2} \right] \left[\frac{(V_{BR} - V_{DD})}{V_{BR}} \right] \text{mH minimum}$
- f. Number of pulses to be applied 1 pulse minimum.
- g. Supply voltage (V_{DD}) -25 V.

4.5.5 Gate stress test.

- a. $V_{GS} = \pm 30 \text{ V minimum.}$
- b. $t = 250 \mu\text{s minimum.}$

TABLE I. Group A inspection.

Inspection <u>1/</u>	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 1</u>						
Visual and mechanical inspection	2071					
<u>Subgroup 2</u>						
Thermal impedance <u>2/</u>	3161	See 4.5.3	$Z_{\theta JC}$		10.0	°C/W
Breakdown voltage, drain to source	3407	$V_{GS} = 0$ V dc, $I_D = -1$ mA dc, Condition C	$V_{(BR)DSS}$	-100		V dc
Gate to source voltage (threshold)	3404	$V_{DS} \geq V_{GS}$, $I_D = -0.25$ mA dc	$V_{GS(th)1}$	-2.0	-4.0	V dc
Gate current	3411	$V_{GS} = +20$ V dc and -20 V dc;	I_{GSS1}		± 100	nA dc
Drain current	3413	Bias condition C; $V_{DS} = 0$ $V_{GS} = 0$ V dc, $V_{DS} = 80$ percent of rated V_{DS} , Bias condition C	I_{DSS1}		-25	μ A dc
Static drain to source on-state resistance	3421	$V_{GS} = -10$ V dc, pulsed (see 4.5.1), condition A, $I_D =$ rated I_{D2} (see 1.3)	$r_{DS(on)1}$		1.4	Ω
Forward voltage (source drain diode)	4011	Pulsed (see 4.5.1) $V_{GS} = 0$ V, $I_D = I_{D1}$	V_{SD}		5.5	V
<u>Subgroup 3</u>		$T_C = T_J = +125^\circ\text{C}$				
High temperature operation:						
Gate current	3411	Bias condition C, $V_{GS} = +20$ V dc and -20 V dc;	I_{GSS2}		± 200	nA dc
Drain current	3413	$V_{DS} = 0$ V dc Bias condition C, $V_{GS} = 0$ V dc, $V_{DS} = 80$ percent of rated V_{DS}	I_{DSS2}		-0.25	mA dc
Strain drain to source on-state resistance	3421	$V_{GS} = -10$ V dc, pulsed (see 4.5.1) $I_D =$ rated I_{D2}	$r_{DS(on)3}$		2.3	Ω

See footnotes at end table.

TABLE I. Group A inspection - Continued.

Inspection 1/	MIL-STD-750		Symbol	Limits		Unit
	Method	Conditions		Min	Max	
<u>Subgroup 3</u> - Continued						
Gate to source voltage (threshold)	3404	$V_{DS} \geq V_{GS}$, $I_D = -0.25$ mA dc	$V_{GS(th)2}$	-1.0		V dc
Low temperature operation:						
Gate to source voltage (threshold)	3403	$V_{DS} \geq V_{GS}$, $I_D = -0.25$ mA dc	$V_{GS(th)3}$		-5.0	V dc
<u>Subgroup 4</u>						
Switching time test	3472	$I_D =$ rated I_{D1} , $V_{GS} = -10$ V dc, $R_g = 24$ ohms $V_{DD} = 0.5 V_{BR(DSS)}$				
Turn-on delay time			$t_{d(on)}$		30	ns
Rise time			t_r		60	ns
Turn-off delay time			$t_{d(off)}$		40	ns
Fall time			t_f		40	ns
<u>Subgroup 5</u>						
Single pulse unclamped inductive switching	3470	See 4.5.4, 116 device, $c = 0$				
Electrical measurements		See table I, subgroup 2 herein				
Safe operating area test	3474	$V_{DS} = 80$ percent of rated $V_{BR(DSS)}$, $t_p = 10$ ms, $I_D = 0.5$ A				
Electrical measurements		See table I, subgroup 2 herein				
<u>Subgroup 6</u>						
Not applicable						

See footnotes 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 7</u>						
Gate charge	3471	Condition B	$Q_{g(on)}$		15	nC
On-state gate charge			Q_{gs}		7.0	nC
Gate to source charge			Q_{gd}		8.0	nC
Gate to drain charge	3473	$di/dt \leq 100 \text{ A}/\mu\text{s}$, $V_{DD} \leq -30 \text{ V dc}$, $I_D = I_{D1}$	t_{rr}		200	ns
Reverse recovery time						

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

2/ This test is required for the following endpoint measurements only (not intended for screen 13):

JANS - group B, subgroup 3.

JAN, JANTX and JANTXV - group B, subgroup 2.
group E, subgroup 1.

TABLE II. Groups A, B and C delta measurements. ^{1/}

Step	Inspection	MIL-STD-750		Symbol	Limit		Unit
		Method	Conditions		Min	Max	
1.	Breakdown voltage drain to source	3407	$V_{GS} = 0$ V dc, $I_D = -1$ mA dc test condition C	$\Delta V_{(BR)DSS}$	± 10 percent		mV
2.	Drain current	3413	$V_{GS} = 0$ V dc, $V_{DS} = 80$ percent of rated V_{DS} ; bias condition C	ΔI_{DSS1}	± 25		

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

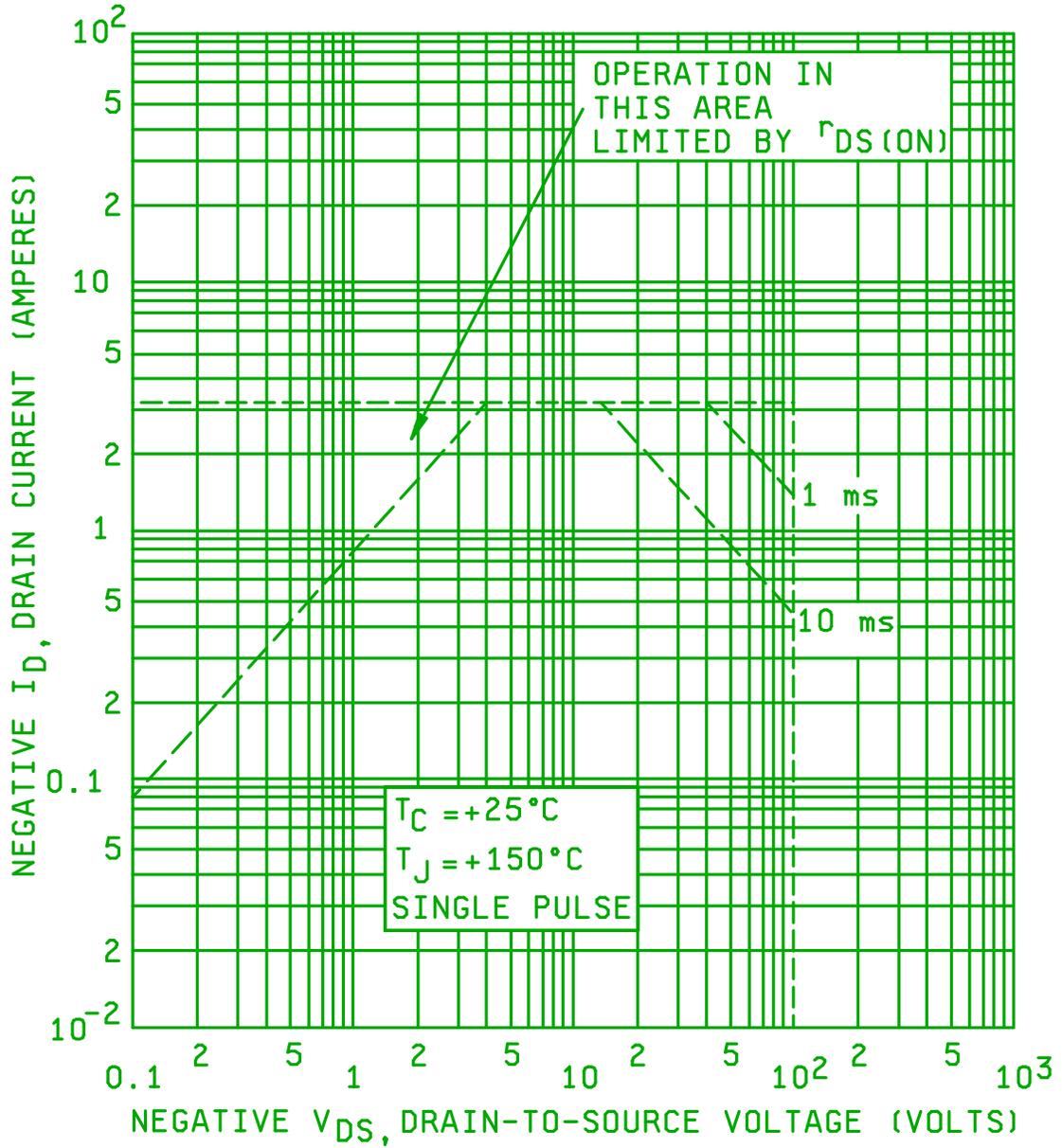


FIGURE 3. Maximum safe operating area.

5. PACKAGING

5.1 Packaging. Packaging shall prevent mechanical damage of the devices during shipping and handling and shall not be detrimental to the device. When actual packaging of material 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 Departments' or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

5.2 Marking. Unless otherwise specified (see 6.2), marking shall be in accordance with MIL-STD-129.

6. NOTES

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

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

6.2 Acquisition requirements. See MIL-PRF-19500.

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 Products List QPL No.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 purchase 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, 3990 East Broad Street, Columbus, OH 43216-5000.

6.4 Substitution information. Devices covered by this specification are substitutable for the manufacturer's and user's Part or Identifying Number (PIN). This information in no way implies that manufacturer's PIN's are suitable for the military PIN.

Military PIN	Manufacturers' CAGE code	Manufacturers' and users' PIN
2N7335	59993	IRFG9110

6.5 Suppliers of JANHC and JANKC die. The qualified JANHC and JANKC suppliers with the applicable letter version (example JANHC2N7335) will be identified on the QPL.

JANHC and JANKC ordering information		
PIN	Manufacturer CAGE 59993	
2N7335	JANHC2N7335	JANKC2N7335

6.6 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 - EC
Air Force - 17
NASA - NA

Preparing activity:

DLA - CC

(Project 5961-1947)

Review activities:

Army - AR, SM
Navy - AS, CG, MC
Air Force - 13, 19, 85, 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
MIL-PRF-19500/599C

2. DOCUMENT DATE 971230

3. DOCUMENT TITLE SEMICONDUCTOR DEVICE, QUAD, FIELD EFFECT TRANSISTOR, P-CHANNEL, SILICON, TYPE 2N7335 JAN, JANTX, JANTXV, JANS, JANHC, AND JANKC

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)
Commercial
DSN
FAX
EMAIL

7. DATE SUBMITTED
(YYMMDD)

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 (Include Zip Code) : Commander,
Defense Supply Center Columbus, ATTN:
DSCC-VAT, 3990 East Broad Street, Columbus,
OH 43216-5000

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:
Defense Quality and Standardization Office
5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466
Telephone (703) 756-2340 DSN 289-2340